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Original Contributions.

INFLUENCE OF THE INLAY ON MODERN DENTISTRY.

BY JOSEPH HEAD, D.D.S., PHILADELPHIA. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT ASHEVILLE, N. C., JULY 28-31, 1903.

Some years ago the reasons given against the durability of the porcelain inlay seemed so plausible that its advocates admitted that inlays could be permanent only in those unusual mouths where the cement itself was insoluble. Time, however, has proved conclusively that a well-fitting, thoroughly-cemented inlay will last in any mouth. In fact, any dentist who says permanent inlays cannot be made simply means that *he* cannot make them, for years of experience have proved that modern porcelains and cements skilfully manipulated can make fillings which as tooth preservers are unsurpassed by any other type of filling in the world.

The claim that the line of cement, no matter how fine, would through dissolution always prove a fatal weakness, has been triumphantly refuted by time, and the recent statements that oxyphosphate of zinc is a pulp killer do not seem to be based on conclusive data. Pulps die under oxyphosphate fillings and they also die under gold fillings, yet no one accuses gold fillings per se of being pulp destroyers. Oxyphosphate of zinc has saved the lives of too many pulps by its virtue as a filling material to be so carelessly accused, and before it is proved that the theoretical amount of arsenic in the powder, or the phosphoric acid of the fluid, has killed a pulp, it will have to be proved that the pulp so said to have been killed was not fatally infected with germs before the cement filling was inserted. With this objection, as with the other objections that have been raised against inlays, time has proved oxyphosphate of zinc cement to be one of the most valuable filling materials known, and if it really were a pulp destroyer, or powerless to with-

stand the crushing force of mastication—not wear nor abrasion, but crushing force—it is inconceivable that its general use would not have made these objections manifest years ago.

The statement that porcelain cannot withstand the force of mastication is not borne out by general experience. No one who has read Dr. Black's articles or seen his instruments for measuring the crushing force of the teeth can for a moment doubt the accuracy of his individual experiments. These experiments show that two steel molars exerting a straight up-and-down force will require a pressure of from forty to eighty pounds to crush beefsteak, also that the jaw is capable of exerting a pressure of from fifty to two hundred and fifty pounds. Theoretically, then, they would exert

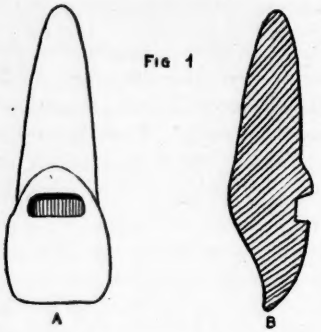


Fig 1

from forty to eighty pounds pressure in masticating beefsteak, but we must remember that practically the triturating motion makes the force actually required considerably less, just as the saw motion of a knife lessens the pressure required. As further proof of the aid given by the triturating motion and saw-like edges of the teeth, all must have noted that frail enamel edges of an insensitive cavity will often break down with but one or two pounds direct pressure of an instrument, yet these edges unknown to the patient will easily withstand the triturating force of mastication. Now, in considering porcelain as a filling material we do not have to consider ordinarily the direct but the triturating crushing strain of which it is capable, and we therefore see why the so-called frail porcelain fillings are able to withstand the force of mastication even in those mouths capable of exerting a direct pressure of two hundred and fifty pounds.

Now we come to consider porcelain inlays in regard to the ever-interesting subject—extension for prevention, and in discussing this let us contrast the ordinary gold filling and porcelain inlay as the two opposite types. In gold we have a non-adhesive filling that is hammered into position, where the slightest mistake in leaving short, unsupported enamel rods will undoubtedly cause a powdered edge and consequently defective margins. That such short rods can readily be left is patent, from the fact that I have seen them in photographs made from ground sections of tooth cavities carefully prepared for student instruction. When, in addition to this, we take into account the factor of personal error that imperils the work of every careful operator, who hammers into position the in-

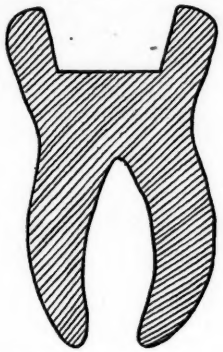
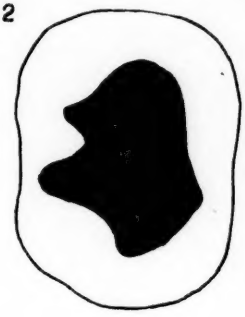


FIG 2



numerable pieces of gold necessary to make a large contour filling, we cannot but feel that the necessity of extension for prevention in ninety-nine per cent of the cases arises more from microscopic defects in the edge of the gold filling than in the general superficial, slowly-penetrating decay as described by Dr. Black.

If there be defective edges extension for prevention will be all the more necessary, as the more infectious material there is on the imperfect edges the more rapidly decay will show itself, and if the defective edge is kept scrupulously clean decay will be so long deferred as to give the filling the reputation of being perfectly made at first. Who has not seen gold fillings with slightly darkened walls remain year after year with the increase of decay so slow as to be imperceptible, and yet these fillings do good service and in spite of defects are successful in saving the teeth. Bearing in mind how these gold fillings with palpably defective edges last for five

or ten years, it is hard to avoid the conclusion that ninety-nine and nine-tenths per cent of the approximal fillings that have recurrent decay have it through primarily defective margins. There are unquestionably in the history of dentistry approximal fillings with perfect margins, as described by Dr. Black, which decay generally all over the surface, but in comparison with the fillings which decay from defective edges these perfect ones are so rare as to be hardly worth considering.

The experience with cemented porcelain fillings seems to bear out these conclusions. The factor of personal error, so far as the edge is concerned, is removed by the presence of an adhesive cement.

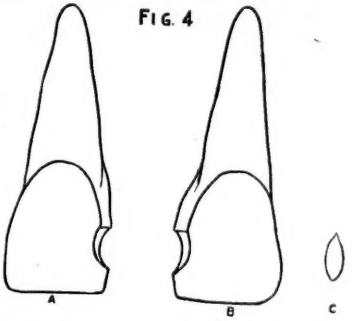
FIG. 3

Any short enamel rods that may have escaped the vigilance of the operator are supported by cement, not broken loose by malleting. The filling adheres to the tooth walls with an apposition that is rarely attained by any but the theoretical gold fillings. Thus, when we look at the margins of a porcelain filling and find them free from decay we know that there has been left no microscopic, deep-searching crevice where infection can enter and undermine the very foundations of the filling before the devastation becomes externally apparent. What one of us can have this same feeling of security about his gold fillings? We are all too well acquainted with the cavities that form in the anterior approximal wall of the newly erupted first molars when they are allowed to rest against the adjoining temporary teeth for any length of time. If these are filled with gold without cutting down from the grinding surface,

according to the principle of extension for prevention, we all know how rapidly decay will recur, but if these decayed spots are carefully excavated as simple cavities and filled with porcelain they will seldom if ever show recurrent decay.

It is true that the porcelain filling always shows a fine line where the cement has slightly washed out, but if this line is so fine as to allow the capillary attraction of the mucus to prevent a constant wash of the solvent saliva along the edge there will be practically no further dissolution of the cement. However, if this line is so large as to make capillary attraction out of the question the cement will be steadily attacked until the filling loosens, but even in these cases it will be noted how seldom decay occurs where the filling is adhesive. If these facts are so, and no experienced porcelain

FIG. 4

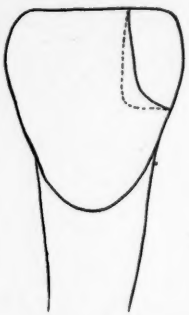


worker will deny them, are we justified in making non-adhesive fillings when we find that adhesive fillings are so much more effective? Take, for example, an ordinary crown cavity in a molar where decay has reached toward the pulp so far as to weaken the buccal or lingual wall. How often does the ordinary gold filling fail here when the ordinary amalgam filling will succeed, and the amalgam succeeds probably on account of its perfect adaptation. But if in such a self-cleansing position we had an adhesive gold filling with perfect edges, barring fractures of the tooth, all will admit that future decay would be impossible. Such a filling I shall now describe, but it must be understood that this filling has been known for the past five or six years.

The cavity should be prepared according to the well recognized principles of Black or Johnson, and the rubber dam should be applied. The fissures should be cut out to the end, and all weak

enamel chipped away in the direction of the rods, so as to give edges that are clean and polished. The decay should be thoroughly removed, and the cavity carefully dried and sterilized with any of the well-known antiseptics. Some advocates of extension for prevention are said to rely entirely upon instrumentation to remove the infection within the cavity, but as it is quite impossible to be sure of having removed all of the germs that may have penetrated far into the apparently healthy dentin, the reason for giving up the use of antiseptics in making the toilet of the cavity is not apparent. Cavities excavated thoroughly and carefully filled without the previous use of antiseptics will frequently remain intact, as the few remaining germs in the healthy tooth structure will usually wither

FIG. 5



A

FIG. 5

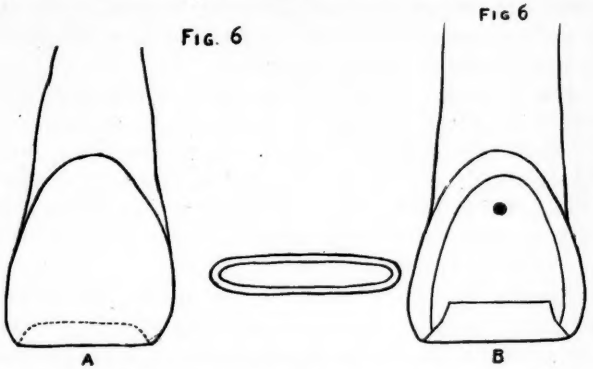
B

away like an army deprived of its commissary, but these germs are nevertheless a source of danger that a soaking with alcohol would obviate. This being the case, have we a right to subject our patients to the risk of having an infected cavity when carbolic acid or alcohol is so easy and successful in its application? If anyone fears the action of the phosphoric acid on the pulp he can line the bottom of the cavity with either liquid gutta-percha or celluloid.

The cavity being prepared, the method of inserting the adhesive gold filling is as follows: Moss fiber gold should be annealed and placed near at hand. Some creamy oxyphosphate of zinc should be dropped into the bottom of the cavity and the gold pressed upon it in all directions down to the bottom of the cavity and up to the edges, so that but a thin layer of cement will remain and all of the cavity walls be covered by the adhesive layer of gold. Now more

gold is pressed firmly upon the bottom of the cavity, and the cement is allowed to set, which process may be hastened by a blast of hot air. When this has been accomplished the gold in the cavity should be thoroughly condensed and more sponge gold added and condensed until a thick solid mass is obtained in the bottom of the cavity. Then with a finishing bur the gold should be smoothed and the edges of the cavity cleansed of any adhering cement. The filling can then be finished with gold leaf or pellets as desired, when we will have an adherent gold filling with perfect margins, a filling where defective edges are out of the question, and where recurrence of decay is practically impossible. The application of this prin-

FIG. 6



ciple to compound approximal cavities is so obvious as not to require further elucidation.

Adherent amalgam fillings can be made in the same way. The cavity should be prepared with sharp, smooth edges, and the alloy mixed to the consistency of soft wax. Then a few drops of soft oxyphosphate of zinc should be dropped into the cavity, and squeezed out by the amalgam being pressed firmly against it into position. The cement should be allowed to set, the edges scraped and cleansed, the rest of the mixed amalgam squeezed dry and added to the amalgam in the cavity until here, too, we have a dense, adhesive amalgam filling that will not discolor.

Here the question arises again, Since recurrence of decay is much less likely to occur around an adherent than around a non-adherent filling, are we as progressive dentists justified in any longer putting in the latter? Having discussed the apparent superiority of adher-

ent over non-adherent fillings, we will now consider how cavities should be prepared for the reception of cemented inlays.

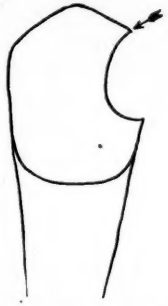
The preparation of simple cavities will be considered, and of these let us make two classes: (1) Simple labial, buccal and approximal cavities on all of the teeth; (2) Simple pit cavities in the bicuspids and molars. As typical of class 1, let us take a simple labial cavity in a central incisor, such as is shown in Fig. 1 (a, front view; b, cross section). In this cavity it will be noted that the floor is made flat, the walls straight and slightly divergent from the bottom, and the margins clean and smooth. The divergence of the walls is for the purpose of letting the stripped inlay settle into the cavity and take up the space previously occupied by the matrix. In all cavities some strong sterilizer should be used just before the cavity is dried and the filling inserted.

In class 2, simple pit cavities, let us take a cavity in the grinding surface of a lower first molar as typical. Here all fissures should be cut out to the end, frail enamel rods broken down, decay removed thoroughly, the bottom made flat, and the sides sloping from it cut at a slightly obtuse angle for the purpose of letting the completed filling take up the room occupied at first by the matrix. The edges should be sharp and polished. Fig. 2.

The simple approximal fillings in the incisors, as before mentioned, are prepared with ease and simplicity according to the lines of Fig. 1, so long as they are purely simple, as in Fig. 3, and have a separation equal to six layers of tape. But when they encroach on the lingual or labial aspects of the tooth, as in Fig. 4, the external edges of the cavity should be first chiselled to firm enamel and then polished smooth and sharp with a sandpaper disk, so that the outline of the cavity will be in the form of a crescent, as Fig. 4, a and b. Then the flat-bottomed cavity wall within the enamel edges should be finished with a flat-bottomed bur. This will make the finished inlay look something like Fig. 4 c, with frail, flat edges that are readily made to fit the smooth curve of the enamel margins perfectly. Too much pressure while inserting this filling will check the margins, but too much pressure must not be applied, and as these frail edges never receive the force of mastication there is no reason why the operator should not take advantage of the ease with which they can be perfectly adapted.

In Fig. 5, a and b, where the formation of incisal angles is represented, the lines show the depth of the cavity and the shape of the inlay. As here presented the incisal corners should be cut with a chisel so that all frail enamel edges are removed, and the enamel polished in a curve with a sandpaper disk, so that the juncture of the porcelain and enamel at the cutting edge shall be identical with the direction of the force of mastication. This greatly lessens the danger of the thin edge of porcelain chipping at the point designated by the arrow. The internal walls of the cavity should be excavated according to the dotted lines, with a flat bottom at the cervix running up to a slight groove at the cutting edge. Some gold

FIG 7



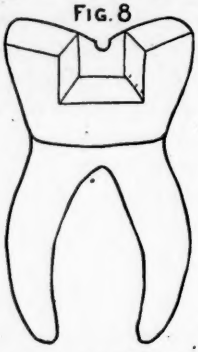
workers marvel at the small amount of retention used for an inlay meant to restore an incisal corner, claiming justly that gold would not be secure with similar anchorage, but they do not appreciate the fact that an adhesive filling does not require the anchorage of a non-adhesive filling.

Cavities for incisal tips are shaped as in Fig. 6, a, where the cutting edge is sufficiently broad to get retention, or in Fig. 6, b, where the cutting edge is thin, and a wedge can be cut out of the palatine enamel to the bottom of the cavity for the purpose of greater retention. In the second case the lateral walls of the cavity should be well grooved to overcome the lateral force of mastication. As in all other cases, the enamel edges should be made smooth and sharp either by finishing burs, Arkansas stones or sandpaper disks.

In the compound approximal cavities of cuspids, as in Fig. 7, the same principle holds as with incisal angles of corners, only the enamel at the cutting edge should be rounded so that the masticat-

ing line of porcelain shall meet it at a right angle and so have the maximum strength. This gives a few, short enamel rods at the point designated by the arrow, but as they are supported by cement they are in small danger of fracture, and certainly have more strength than a knife edge of porcelain. In compound approximal cavities in molars and bicuspids the procedure is practically the same. The sides should be cut out according to the lines of extension for prevention, as in Fig. 8. The edges should be smooth and polished, all decay of course being removed. The bottom or cervical aspect should be flat and the sides slope in, so that the inlay must be wedge-shaped, slipping in to take up the space occupied by the

FIG. 8



matrix. The cavity may or may not be extended into the pit. As in adhesive fillings, sufficient retention can readily be obtained without the aid of the pit extension, but if such extension is advisable it is of course to be done in the form of the usual step, as is crudely shown in Fig. 8.

In conclusion it may be stated that inlays should be of such shape that the force of mastication will keep them in position, and that they should rely upon the cement to steady them more than to keep them in place.

Discussion. *Dr. G. V. Black,* Chicago: Some of the older men will remember that about thirty years ago a great many practitioners were capping pulps successfully, yet how completely the practice has disappeared. Everybody could save pulps in those days, and any attempt to convince them to the contrary would have been like trying to dam the Mississippi at flood time. I allude to this simply to remind you that floods come in the thought and methods of the

dental as well as other professions and sweep all along with them. This is flood season as regards porcelain inlays, but the problem will be worked out in due time. Meanwhile it is difficult to discuss intelligently many of the questions that come up, because we have not as yet a full view of the subject. I want every man to experiment with porcelain, because it will be of great benefit if it proves up to all that is claimed for it. We should commend the enthusiastic workers in this line who are developing the facts concerning the material. In discussing porcelain inlays we often ignore the conditions present, and the questions of immunity and susceptibility are almost always lost sight of. It is true that imperfect fillings stand and give good service in some mouths, although they would not last twelve months in a condition of high susceptibility to decay. We must not rely too much on the fact that fillings with black margins sometimes endure, as such fillings in a child or in an adult susceptible to decay would not stand at all. These matters of existing conditions, immunity and susceptibility must be considered in this work as well as with other filling materials.

For many years I have warned against placing antiseptics in a cavity after it has been prepared. I have no objection to antiseptics, but they should be used before the preparation of the cavity is complete. After having applied carbolic acid or even alcohol you cannot get the walls of the cavity in condition to receive a filling except by retrimming them. To be perfect the filling should be built against the clean fresh-cut cavity wall, regardless of whether it is a cohesive or noncohesive filling.

Extension for prevention means simply the extension of the cavity in the direction in which there is most likely to be recurrence of decay, and does not mean extension in other directions, or extension for convenience, or extension for outline. I think the essayist rates too highly the number of failures from the imperfect manipulation of gold, although it is the cause of many. The number of failures from extension or recurrence of decay is much greater than he estimates. I have seen cases where extension was made clear around the angle of the tooth, which is not extension for prevention at all. In proximal cavities extension for prevention is broadening the cavity towards its gingival portion where the teeth lie near together, and towards the axial angles a sufficient distance to allow the surfaces of the teeth to be well apart where the margin of the filling

is laid. Any extension necessary beyond that is for some other purpose. The angles of the teeth from occlusal to gingival margin, the axial angles, are safety lines in so far as the beginning of decay is concerned. That is true in all positions from which we work. There is no exception to this rule in smooth surface cavities, and the same holds with buccal cavities. There may be places now and then where decay will commence on an axial angle, but they are very rare. Then extension towards same, not past, is true extension for prevention. The frailty of the margins of porcelain will not allow us to make the best cavity preparation, but we must take the risk and let experience determine what such risks amount to.

Dr. C. Edmund Kells, Jr., New Orleans: Since porcelain inlays have come into such prominence we should not forget to honor the man who first introduced these fillings. About sixteen years ago Dr. William Herbst came over from Germany and gave a clinic before the American Dental Association, showing his glass fillings baked with the Bunsen burner. Jenkins was the next to take it up.

There are fillings in my teeth which my father made thirty-five years ago with noncohesive foil, and they seem good for thirty-five years more. The cavities were wiped out with carbolic acid and creosote. To my mind it is absolutely essential to wipe out the cavity with creosote before inserting the filling, and I have had signal success by this method.

Dr. Jonathan Taft, Cincinnati: I was glad to hear Dr. Black say what he did about extension for prevention, for many operators have been laboring under a misapprehension regarding it. In promulgating this method Dr. Black's idea was simply to cut away all decayed tooth structure to a point where the filling would prevent any recurrence of decay. In many cases this is not done even today, for how often defective enamel is left close to fillings, especially in the occlusal surface of molars. Not long ago I witnessed an operation by a dentist of note in which almost all the enamel on the occlusal surface was cut away, yet the tooth was in the main in good condition. Do not go to extremes in either direction, but follow the middle course as outlined by Dr. Black.

I do not believe it is necessary to apply antiseptics to cavities before inserting the filling. Fifty years ago such a practice was comparatively unknown, and fillings made even as long ago as that are doing well today.

I believe porcelain fillings have come to stay, and while many seem to have a false conception of the facility and speed with which they can be made, the operator who is careful will be successful. The thorough introduction of porcelain will serve a valuable purpose, especially because of improved appearance of fillings, and on account of its causing no thermal trouble.

Dr. Head, closing discussion: One point made by Dr. Black should be especially noted, as many have an erroneous idea of his conception of extension for prevention. He does not mean the wholesale destruction of the approximal aspects of teeth. There is nothing very radical in extension for prevention, and those who have conscientiously lived up to the highest dental art have been practicing it for a long time.

While it is true that some of the older practitioners filled teeth without the use of antiseptics, I believe the greater majority employed them.

PRESIDENT'S ADDRESS.

BY L. G. NOEL, D.D.S., NASHVILLE. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT ASHEVILLE, N. C., JULY 28-31, 1903.

Six years have elapsed since our National Dental Association was organized by the union of the American and Southern Dental Associations. Let us see if we have been faithful to our trust in the meantime. Have we been energetic, enthusiastic, and prolific? We have produced some most excellent scientific and literary work that cannot be summed up and set before you for your admiration and satisfaction, because such work is educational, and therefore invaluable on account of its far-reaching influence, but should we not have accomplished much more?

Our Membership.—If the benefits we derive from our membership and attendance upon the meetings of this Association can be made apparent to our fellow practitioners they will lose no time in joining us. Our difficulty here lies in our inability to make tangible our mental acquisitions. It follows then as a necessary conclusion that we must add to these invisible benefits something more apparent and better calculated to fix the attention of the rank and file of the fraternity. It may be urged by some that we will do better with an exclusive organization composed of the flower of our profession.

This opinion, I am sure, must give way before a thoughtful examination of the subject, for while our doors are well guarded against the unethical and vicious, our mission clearly is to elevate and instruct the humble and deserving who feel the need of our teaching. As the best indication of our condition is our growth, it may be well to briefly review the progress made during the last few years.

When the American and the Southern Dental Associations were united in 1897 we started out with an organization numbering three hundred and sixteen active members and twelve honorary members. Our second meeting at Niagara Falls in 1899 showed an enrollment of three hundred and seventy-four, an increase of forty-six. At the third meeting at Old Point Comfort we produced a list of three hundred and eighty-six, an increase of twelve. At the fourth meeting in Milwaukee we had a list of three hundred and fifty-five, a falling off of thirty-one. At the fifth meeting at Niagara Falls last year we had three hundred and sixty-four, having gained nine over the previous year. The above figures are from the Treasurer's report, which gives only the names of those present at the meetings and of the absentees who send in their dues. The list of members as I obtain it from the publishers of our transactions gives a total of four hundred and twenty at this time.

A letter addressed to the publishers of Polk's Directory, asking the number of dentists in the United States, elicited the following: "Your esteemed favor of 23rd inst. is received and we regret that we are not in possession of the statistics desired by you. We have, however, gone over the Register and computed the number of dentists in the United States, which makes 28,481 according to the last directory. We enclose the slips made out by our clerk which will give you the number in each state. We would not feel safe in estimating the number who are registered and who are legalized practitioners. In all cases where we were able to procure the information the directory shows who are registered, but in many instances this information was not obtainable."

Allowing for the large number of advertising men and those who by unethical methods put themselves outside the ranks of the regular profession, we estimate the number available for membership in this Association at ten thousand at the least. When we contemplate our present enrollment of only four hundred and twenty members it will be admitted that these figures do not show as rapid growth as

we had reason to anticipate, and it will be well for us to endeavor to find out the obstacles in the way of our increase. I have put this question to many of our thoughtful and zealous members during the past year, and numerous reasons have been assigned, some of which I shall set before you, begging that you give the subject a searching examination to the end that we may remove these hindrances and henceforth show a development equal to that of other similar scientific organizations in America.

Love for Our Association.—The first and the greatest cause for our humiliation is a lack of love for our National Dental Association. If we had the same love for it and the same pride in it that we feel for our everyday work, how different our meetings would be. How much more gratifying to contemplate the result of each year's transactions. If we were inspired by such a love for our Association we would glory in making sacrifices for it. We should need no price to purchase our devotion, but would pursue our work with ardor because of our pride in the honor our achievements would bring to our profession. On the contrary, are we not often actuated by small personal ambitions rather than these nobler sentiments, and do we not frequently fritter away valuable time in our meetings in the promotion of petty political schemes? Have these not engendered frictions resulting in enmities between our members, causing some to absent themselves who should be with us to-day doing valiant service for our common cause?

We must leave these petty motives behind if we would see this organization grow and prosper. Let us come to our annual meetings with clean hearts, warm with fraternal love. Let us bury forever all enmities and jealousies, that we may labor as one man for the benefit of suffering humanity. We must throw ourselves into our work with all of our united energies, with singleness of purpose, forgetting our small, selfish interests in an earnest desire to elevate our calling and make it glorious before the world. Let us carry these sentiments into the work for our state societies as well as for this Association, resolved that in making them do for themselves we shall make them build up the parent body.

Time of Meeting.—Many with whom I have talked think the time we have chosen for holding our annual meetings is unfortunate, and urge that quite a number wish to avail themselves of the vacation season to go abroad. Others wish to go with their families and

friends to seashore and mountain resorts. The busy practitioner feels the need of rest during the heated term, yet we come to our meetings for work. On the other hand, winter is the best time for scientific study and such work as we do at our meetings—the season when the brain is most active, and when on account of the rough weather and short days we can do but little practice, hence can better spare the time for our meetings. The objection that a number of our most prominent members are engaged in teaching in dental colleges and cannot leave their work during the term does not seem to be sustained by the facts, for at some special meetings held in February, and notably at our southern branch meetings in that month, the attendance of college men has been large. I would therefore recommend that we try the month of February for the meeting of 1905.

Revision of the Constitution and By-Laws, and Our Relation to State Societies.—In his address at our fourth meeting in Milwaukee the president, Dr. Black, called our attention to some defects in the constitution and by-laws, suggesting several amendments. In this address he pointed out clearly the reasons for these changes and the good to be effected by their adoption. Having compared Dr. Black's proposed new constitution with the original, and having studied these in the light of his address, I find much to commend in the new constitution, and therefore recommend that the committee having this matter in charge be instructed to go over Dr. Black's work and get ready to present the new constitution for adoption as early as possible.

The original intent in providing for delegate members was to build up our Association out of the material sent us by the state societies as delegates. This method had long been in use and was found efficient in the two bodies that united to form this Association, and it can be seen by examining their records that in most instances delegates from state and local societies allied themselves with the parent body as permanent members. The idea in making representation by delegates from smaller organizations a feature was to produce a reciprocal benefit between those societies and the National. It was expected to result in the formation of new state and local societies and to compel a recognition by all these of the National body. It was intended that annual reports of the membership and work of the state societies should be made at the National meetings,

and that the parent body should assume a fostering care of the state societies, making membership therein much to be desired. It appears that these beneficent results have not been reached because representation has not been sought by these lesser organizations. Our delegate membership has grown smaller from year to year until at the last meeting we had but four. We have a standing committee whose duty it is to "arouse interest in and secure the cooperation of the various state and local societies in the work of the National Dental Association." I hope that this committee has been diligent in its work and that we shall see the fruits of its labors this year. Each state society should be requested to appoint a committee to cooperate with said committee.

In Dr. Black's address he stated that in 1895 the American Dental Association, composed of two hundred and fifty-five permanent members, had fifty-three organizations represented by delegates. We seem to have departed somewhat from the representative features of former days. Dr. Black has introduced into his new constitution a section in the article on membership to correct this evil. All state societies should be requested to publish in their programs the time and place of the meeting of the National Association, and the secretaries should be required at the close of the state meetings to forward to the secretary of the National a list of the delegates elected to represent them. The constitutions and by-laws of all the state societies should be so amended as to enable the presidents to appoint delegates. Delegates should be appointed by the president and not elected by ballot, the reason for which is obvious. Often the state meeting is over when the would-be delegate makes up his mind to attend the National. For each delegate an alternate should be appointed, and while permanent members of the National should not be chosen as delegates, they may be made alternates.

The amendment requiring the corresponding secretary to make an annual report, showing the condition, membership and work of the state societies, is one of the best means of preserving the mutual interest between the state organization and the parent body, and should be adopted. In prosecuting the study of methods for increasing our membership and keeping up enthusiasm in our work this idea of preserving the interest of the state societies in the National body and of making them show their allegiance thereto has constantly gained force and has been repeatedly suggested by those

with whom I have consulted. I therefore ask the committee on constitution to study the question thoroughly and shape our constitution to this end.

The suggestion has been offered that provision should be made in our constitution to enable state societies to tender membership in the National to any one obligating himself to subscribe to its constitution and by-laws and pay a certain sum, a portion of which is to be forwarded to the treasurer of the National.

I would also recommend for your favorable consideration the method proposed in the new constitution of dividing the work into sections, and the retention of the chairmen of the sections for two years after presiding over a section, to overlook and assist in the conduct of the work. The idea of forming a program committee of these chairmen, who are to be well distributed over the country, three from each section, is especially well conceived and should be adopted. The need of a program committee is obvious. The present method of putting upon the president and secretary the final work of making up the annual program is very defective, and I am sure all those who have labored to make up the program and have felt the burden of this responsibility will heartily approve and welcome the change.

Branches.—If we would see our society grow into a large, vigorous, and healthy organization of several thousand active members we must enlist the hearty interest of every portion of the country. At present there are large sections of the United States where little is known of the National Dental Association and its work. This is especially true of the west, as the distance is so great that very few can undertake to make the annual journey from the Pacific States to places east of the Mississippi River, and men cannot spare so much time from their work. Under our present constitution and the manner in which we have arranged to rotate our meetings, two-thirds of them must necessarily be held east of the Mississippi, compelling our western members to make these long journeys if they would take a part with us. Some of the best men in the profession reside in the west, and we need and should enlist their interest. We should do this by organizing a branch in the west according to the plan proposed at the time the union was effected.

I believe that a branch in the east would be a good thing, but I am told that a meeting was called somewhere in that section for the

purpose of organizing a branch, and after some discussion it was decided to dismiss the subject for the time, as most of those present thought the east had already too many societies. If this is the prevailing opinion in the east I would not insist upon a branch for that section, but the west needs it worse than the south ever did, and we need the west with its rapidly increasing population, its energy and brains. The founding of a branch in this section is clearly the best method of getting in touch with its remote regions, and I therefore recommend the appointment of a committee at this meeting to carry out that object.

The Need of Conducting Our Own Publications.—In discussing available means of improvement, another method that is constantly brought up is the publication of a monthly journal that shall be essentially the organ of our society. In a monthly of this character the papers and discussions, reports of clinics, and general transactions would reach us much sooner than by the present method of waiting for the annual volume of transactions, but it need not depend alone upon this source of supply, for many would be stimulated to write articles for our journal in the interim between sessions. The journal could also give us the news of the day in our profession, reports of papers and discussions from other societies, professional items from foreign countries, in short, any matter that would be of interest to the dental reader. For examples of the successful conduct of monthly journals by organizations like ours, I point you to the British Dental Association and to the American Medical Association. The old objection that we cannot raise the necessary funds as long as our membership is so small will yield before a little determination and strenuous effort. Let us first appoint committees in each state to solicit subscriptions, and as soon as we get one thousand paid subscriptions the publication may commence. I believe this easily possible if the idea meets with your hearty and unanimous approval, and with one thousand subscribers we should easily get advertisements enough to make the journal a success. In a short time we may be able to offer our journal with the volume of transactions to all of our permanent members for the annual membership fee, which would be found a strong inducement for new members. If we go into this enterprise we should have for its management men who have had experience in such work, and our journal should be superior to all others. It should be edited by a man of ability,

thoroughly experienced in such work, and issued from the press of publishers well equipped to produce the best results. Every member of our Association should feel obligated to give the enterprise his most earnest and unqualified support, even to the extent of standing assessments for its maintenance if necessary until the enterprise shall have become self-sustaining. With the same equipment we could print our volume of transactions, avoiding the delays that have been complained of in the past.

The International Dental Congress.—The idea of holding an International Dental Congress at St. Louis in connection with the Louisiana Purchase Exposition had its origin in the minds of some of our members from Missouri, who put it before the state and local societies and the officers of the Exposition, and as the scheme grew in strength it was decided to put it in charge of the National Dental Association to carry through. Accordingly it was decided at the last session to extend an invitation to the Federation Dentaire Internationale, then soon to convene in Stockholm, to unite with us in holding a congress at St. Louis in 1904. A resolution was offered to this effect and delegates were sent to the meeting at Stockholm to convey the invitation. Your president, Dr. Libby, in accordance with your wishes and the expressed desires of our delegates to the Federation Dentaire Internationale, appointed a committee of fifteen to organize the congress. Your invitation was accepted and the Federation appointed a committee of nine to collaborate with your committee.

There arose some most unfortunate misunderstandings between these two committees that resulted in very regrettable delays and frictions, but it is to be hoped that all this is over and that the work will be pushed forward with energy, all resolved to cooperate harmoniously to make this the largest and most enthusiastic gathering of dental surgeons the world has ever seen. We must go into this work resolved to make the scientific and literary features of the congress a success, and determined to let nothing mar the dignity of our proceedings.

Your committee of organization extended also an invitation to the British Dental Association, at its recent meeting at Brighton, England, which invitation was conveyed to them by our duly appointed delegate, Dr. M. H. Cryer, and I am happy to report that it was accepted, and that we are to have as our guests at the congress

the representatives of that large and important scientific body. I would recommend that you extend similar invitations to all important national dental societies throughout the world, that we make this truly an international dental congress in the fullest sense.

Provision for Our Aged and Invalid Members.—So many instances of aged and invalid dentists seeking assistance from professional confreres have presented themselves to my notice that I have long entertained the thought that it would be a good thing to raise a fund in our Association to be used for their maintenance. I have talked with a few of our members and all seemed to think well of it, but no one has offered a practical suggestion as to the ways and means for raising the money. If we could increase our membership to several thousand we might in the course of time accumulate a surplus fund, as the American Medical Association has done. It is said that it has a surplus of sixty thousand dollars in the treasury.

Do we need to wait so long for the accomplishment of an object so desirable and so benevolent? I think a fund for this purpose could be started by subscription. When the profession wanted money to fight frauds it was promptly raised by subscription, and nobody who gave to the cause ever missed the contribution. If I could succeed in enlisting your interest in this cause you would raise twenty thousand dollars before this meeting adjourns. I would suggest that a committee be appointed to solicit subscriptions for this fund, and that the chairman of this committee be the treasurer, and be required to give a bond for safety of the fund. This committee should be ever active and diligent in soliciting funds for this object. Each state society should be encouraged to appoint a committee to prosecute the work, and the funds raised in the state societies should be paid annually (or oftener) into the hands of the treasurer of the parent committee.

It should be the policy to invest this money in safe and reliable securities, and use only the interest in alleviating the wants of those aged members applying for our charity. The distribution of this fund should be safeguarded by the most careful and rigid examination into the circumstances, habits, and surroundings of the applicants, that aid may be always judiciously and worthily bestowed. As to the manner of investment for safety combined with a good return in interest, we could profit by the examples set by

some of our large insurance companies. The thought has occurred to me that the money could be more quickly raised for this purpose by adding a life insurance feature, as in some of the benevolent societies. If you can offer a small life insurance policy with membership in the Association, it will build up your society rapidly. If there is anything in this idea I trust you will give it life and form after discussing it.

Another thought has been that something might be added to this fund by legacies coming to us from the opulent whose generosity may be aroused by benefits conferred during life by our profession, or from members who die without heirs to inherit their accumulated wealth. Much can be done by constant effort on the part of our members to keep the thought in the minds of the rich and benevolent. If we could see our old and invalid members drawing each a little annual pension from a fund like this, without diminishing the source of supply, and the families of our deceased members receiving a sum of money at the demise of each member, we should indeed feel that we had placed before the world visible evidences of the good to be derived from membership in the National Dental Association.

Recognition of the D. D. S. Degree.—At the last meeting of the American Medical Association the following resolution was passed: "Dentists who hold the degree of D. D. S. from a reputable dental college, and who are members of a recognized local or state dental society, may be admitted as dental members on recommendation of the officers of the Section on Stomatology and approval by a majority vote of the Section, the names of such members to be sent to the secretary by the secretary of the Section. * * * Dental members shall enjoy the same privileges as regular members and be subject to the same conditions." For several decades the attitude of the medical world toward the specialty of dentistry has been growing more deferential, and we have had from time to time marked evidences of approval, such as the founding of schools of dentistry in our great universities, the establishment of departments for teaching oral surgery in schools of medicine, and the opening of the Section on Stomatology in the American Medical Association. When the Section was first organized only those holding the M. D. degree could become members. This act admitting dentists to full fellowship in the above-mentioned body is the final recognition for which the specialty of dentistry has

been waiting for more than sixty years. I therefore recommend that a committee be appointed to make formal recognition of this action.

If the opening words of my address were not altogether flattering and commendatory of the things we have done, if it is apparent that we would have done better had we put forth our best efforts, there yet remains much cause for congratulation and hope for the future. Not the least of these is this recognition from the medical profession of our worthiness to affiliate with them. One deep-rooted conviction I wish to lodge in your minds as a closing thought—as our progress in the past has been due to our close relationship to the profession of medicine, to the aid, the instruction and encouragement we have drawn from that great source, so will our future be. Then let us draw nearer and foster and encourage a closer relationship as our brightest hope for the coming years.

PREPARATION OF THE CAVITY AND USE OF PINS IN CONTOUR PORCELAIN INLAYS.

BY THOS. P. HINMAN, D.D.S., ATLANTA, GA. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT ASHEVILLE, N. C., JULY 28-31, 1903.

The necessity of making porcelain corners, and their retention on broken or decayed incisors or cuspids, has taxed the ingenuity of the most skilled dentists. To properly prepare a cavity in a central incisor, where the mesio-incisal angle is gone (I use this cavity simply as an illustration), the first essential is to cut the mesial enamel wall at a right angle with the labial enamel, and the same procedure is followed with regard to the mesio-lingual wall. Then the mesial enamel walls should be at right angles with the incisive edge of the tooth, for if this angle be an obtuse one there is great danger of the porcelain breaking at this point during mastication. If, on the contrary, this angle be left acute there will surely follow a cleavage of enamel which will make the inlay a failure from an esthetic as well as a practical standpoint. This is really the greatest point of weakness in porcelain contours. Even when the mesial walls are at right angles with the incisal edge there is still some liability of fracture.

To prevent this Dr. Joseph Head suggests that where these chipped edges occur they may be repaired and further fracture pre-

vented by cutting away the lingual wall of enamel on the incisive border next to the inlay and inserting a little cement, into which is pressed sponge gold, and when the cement is hard add enough gold to slightly overlap the porcelain. He says this will form a perfect protection to this weak point, but it is a procedure which I have never tried.

In preparing the basal wall of the cavity I prefer to cut it at a right angle with the axial wall. This holds good for both labial and lingual enamel and gives a square base on which the porcelain rests. This should be done with a square-end fissure bur, which is kept cool and free from chips by being thoroughly wet with water from a syringe in the hand of an assistant. The mesial and distal enamel walls are then polished by a rapidly revolving cuttle-fish disk, being held at a right angle with the labial surface of the tooth. Great care should be taken to prevent the rounding of the incisal angle.

Swaging Matrix. Plenty of separation having been previously obtained by wedging, the platinum foil is now swaged into place in the cavity. I prefer always to swage the platinum matrix by forcing it into place with a large pellet of moistened cotton, and then with a piece of orange wood trimmed to a wedge shape and inserted in an automatic mallet drive the cotton into the cavity by repeated malleting, which forces the platinum into close apposition with the cavity walls. The many advantages of the mallet are obvious, as it prevents the tearing of the matrix and carries the platinum down between the teeth more perfectly than any other plan I have heard of heretofore. The cotton prevents the plugger from striking and fracturing the enamel margins, as well as holding the matrix in place during the process of malleting.

After using the plugger the margins should be burnished thoroughly with a ball burnisher and the labial lap with a flat burnisher. The matrix is then removed and a No. 3 round bur used to drill a hole in the basal wall of the cavity in line with the axis of the tooth, well in from the enamel margin, but not near enough to affect the pulp. This hole or pit should be about one-thirty-second of an inch in depth.

Threaded iridio-platinum wire 20 gauge is fitted in the pit, and should extend to its bottom and protrude about half the distance between the incisive edge and the basal wall. The portion of the wire entering the cavity should be flattened like a spade, which

is done for the purpose of causing the porcelain to readily engage the pin. The matrix is replaced in the cavity and seen to fit perfectly; the platinum is then punctured over the pit and the prepared pin placed in position. The flattened portion extending into the cavity is placed and waxed so that its greatest diameter will be mesio-distally, which prevents the wire from showing through the porcelain after it is baked. The matrix and pin are then removed in a small modelling compound impression, and a model is run in Stone's investment compound, which does not appreciably shrink, expand or melt in the intense heat of an electric furnace. In compound approximal inlays the same plan is followed, but two pins are used.

Where this is an accidental transverse fracture of an incisor running from the gingivo-mesial angle nearly to the disto-incisal angle a step is used, cutting away the broken portion of the tooth next to the incisal edge and making the axial wall of this step at a right angle with the incisal edge. A small pit is cut in the basal wall of this step and a pin is fitted in the same way as has been described, care being taken not to encroach upon the pulp and not to let the pin protrude far enough beyond the pit to show in the finished inlay. I have used pins of this description in many cases with very good results, and if care is taken the pins thus flattened will not show through the thin labial portion of the inlay.

In conclusion let me add that great care should be used in the selection of cases for contour inlays, for if every cavity needing a contour is filled with porcelain, irrespective of conditions, many failures must be the inevitable result. If, however, care and judgment are used many faces will be beautified where their expression would be marred by a vulgar display of gold.

Discussion. *Dr. L. E. Custer,* Dayton, O.: If I had discussed either Dr. Head's or Dr. Thompson's paper I should have found fault with the mechanical anchorage suggested for the anterior teeth, and I am glad to see that Dr. Hinman has advised securing more stable anchorage for anterior inlays.

Dr. F. B. Noyes, Chicago: I do not wish to be understood as condemning the use of pins for anchorage, but I think we should consider very carefully in individual cases the amount of support which pins will give. The pin furnishes no more support to the filling than the firmness with which it is held in the porcelain. That

is, if the pin is placed in the porcelain the support to the filling is not greater than the force required to displace the pin. In an anchorage on the gingival floor which was referred to, with a groove made in the dentin just inside the enamel, and with the walls sloped, it is supported by that much porcelain. The pin is at one point in the gingival wall, while the groove extends the whole distance from labial to lingual in the gingival wall. We must recognize at once that mechanically the groove has greater suitability than the pin.

Dr. Boles, Washington, D. C.: In my experience it is not possible to secure such perfect adaptability to the cavity with pins. My method, especially with anterior crowns, is to make a slight depression at the incisal portion, where the retention is in the cervical, and cut a groove in the corresponding part of the crown. I do not make a groove at the cervical portion because of the step formed there. In other words, I make a tongue in the part that goes into the cavity, and a corresponding undercut in the cavity, forming what is known in mechanics as a key. I have been surprised to see the resistance this offered to displacement, and there seemed to be perfect adaptation.

Dr. C. B. Colson, Charleston, S. C.: There are cases where pins are not indicated at any time, namely, in children's teeth, and it seems to me that all the essayists have neglected to emphasize one important point—the indication for porcelain work in the young. Inlays are indicated in children's teeth of all places, and here porcelain is much better than cement or gold.

Dr. R. B. Adair, Atlanta, Ga.: I am one of those who went crazy over porcelain work and inserted inlays wherever they would possibly stick, so I have some trouble with these cases coming back. At the present time I have three cases of transverse tips, put in with pins as Dr. Hinman has described, and these have broken out. I used a staple and had a pin on either side of the pulp. The inlays did not break, but the enamel on the labial surface of the teeth did, and the fillings are out. It seems almost impossible to repair the damage without cutting off the crown or building out with gold. I would ask Dr. Hinman how he would manage with rather thin teeth having a transverse fracture and the pinholes broken out near the pulp. I don't believe pins in porcelain work are as strong as a ledge of well-baked porcelain.

Dr. Hinman, closing discussion: Dr. Boles brought no argument against pins, and as he has never used them he cannot intelligently criticize them. In Dr. Adair's cases I would say that it was absolutely out of the question to try to use porcelain in a tooth so thin that it would not hold a pin without fracturing the enamel. I cannot suggest a remedy, never having had a case where the inlay broke the enamel. It simply shows that the pin is secure with the porcelain. He would better make a fresh cavity and matrix and bake a new inlay.

ETIOLOGY.

REPORT OF THE CHAIRMAN OF SECTION IV, NATIONAL DENTAL ASSOCIATION, BY J. D. PATTERSON, D.D.S., KANSAS CITY, MO. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT ASHEVILLE, N. C., JULY 28-31, 1903.

In the etiology of disease which is of interest to the dental profession, and which has been brought to notice more prominently during the past year, we note statements as to the etiology of dental caries by Kenneth W. Goadby, bacteriologist of the London Dental Hospital, as follows: "Dental caries, like putrefaction, is rarely caused by one species of microorganism, and the reaction of the medium in both caries and putrefaction undergoes fluctuation from acid to alkali, and in both processes an alternation of species takes place according to the phase of phenomena. * * * One of the chief difficulties in discussing the whole problem is to attempt to explain the process of dental caries without having regard to the importance of several rather than a single predisposing cause. * * * Dental caries is not a specific disease due to a certain specific microorganism; it is no definite entity, but a process occurring through the operation of certain biological and physical laws."

These extracts from Mr. Goadby's new work, Mycology of the Mouth, places before the scientific world in a textbook for the first time what different brochures and journal articles have in late years been suggesting, and which is stated in the following words—"It seems not improbable that the various pathogenic bacteria which are to-day associated with disease were at one time simple saphrophytes, and that some of the simple saphrophytes as we know them to-day may yet attain pathogenic powers. * * * Not to ad-

mit such a development of pathogenic power entails the obsession that pathogenic bacteria were created by design to destroy human life, and, moreover, such a refusal places us at variance with the monistic conception of the Universe, and the orderly operation of the laws of evolution with which all observed phenomena accord."

Attention is directed to the fact that this statement is a radical advance, and that former classification according to preconceived and accepted ideas of the morphology of bacteria must give way to more scientific lines in the study of species. It is now known that under certain circumstances the individual cocci with certain environment and food media may become so much elongated as to appear allied to the bacilli, and it must include the belief that the change of form also includes a change in virility. In this connection I cannot refrain from noticing that the recent investigations in this field have received much attention from men in our profession, and while the old ideas regarding specific bacteria, and the belief that pathogenic forms were so created at inception, and that their purpose is to destroy human life, have their supporters, the more modern and rational biology of bacteria attracts those who are not bound by tradition.

The whole field of bacteriology should certainly be of unusual interest to the dentist, for bacterial invasion of the whole body is usually through the mouth. It is now known that some fifteen hundred organisms have been described, and that a large proportion of them are occasionally to be met with in the mouth. The virulent bacillus tuberculosis, pneumococcus, Klebs-Loeffler bacillus, streptothrix actinomyces, and other grave forms of pathogenic bacteria are frequently found in the mouth when no disease affects the person. In this connection I would direct attention, as I did in the report of 1899, to the duty of the dental and surgical operator as to precautions against conveying by sneezing, coughing or speaking, pathogenic germs which may lurk in his own mouth to that of his patient. In these days of extreme care in instrument sterilization let us not forget the equally important fact that virulent germs are often expelled from the mouth even in ordinary conversation.

In the study of oral pathological conditions, notably of pyorrhea, continued effort is being made to isolate a specific microorganism to which the disease is due and which will solve its etiology. We

have to report that there is no tangible evidence of a specific micro-organism for pyorrhea alveolaris. After pointing out eight forms of cocci and bacilli which have persistently been found in the disease Mr. Goadby says, "It is obviously impossible, therefore, to say which of these organisms is especially related to the disease or if the various morphological forms cited are only the various phases of one or two schizomycetes, or if the various forms are related to some higher class of organism." He also says, "Anyone who has been engaged for any length of time in the study of mouth bacteria cannot fail to have been struck with the difficulty of recovering in pure culture the organisms seen to be present in the pus of pyorrhea."

Other investigators still cling to the statement of premises which preclude the presence of pyorrhea without nutritional disturbance. In a recent article by Dr. E. C. Kirk, touching upon systemic phenomena in pyorrhea, occurs the following passage—"The disorder to which I invite your attention is that type of chronic suppurative necrotic inflammation in which the infection of the retentive structures of the tooth is deep-seated, where the suppuration is of the abscess type rather than of the ulcerative, where salivary tartar is not the obvious irritative cause, where local treatment alone is inadequate to effect a cure or prevent recurrence of the disorder, and where some error in the nutritional process of the individual is a constant factor in the case." The above contention is held by a few writers in spite of the fact that clinical observation in the experience of your chairman teaches close observers that the disease is quite as prevalent in a condition of otherwise good health as it is in cases of aberrant health, and that a cure of the disease is often effected without the correction of faulty metabolism present. This belief in no wise opposes the very properly taken ground that the ravages of pyorrhea and the difficulties of cure are greatly increased by the presence of debased nutritional conditions, but the type of disease described by Dr. Kirk is found in factors which prejudice or destroy the functions of the oral tissues, and in the large majority of cases such conditions are superinduced by strictly local irritations, and upon the removal of such local irritations cures are effected and are permanent so long as perfect hygienic conditions are maintained.

In the discussion of this subject and the former reference to the

search for a specific microorganism of pyorrhea, your attention is directed to the most recent researches as to the connection of bacteria with diseases of a malignant and progressive type, and which are of great interest in proving how potent a continued local irritant becomes. Prof. Lubarsch of Posen, Germany, says, "Even if the etiologic role of parasites in the causation of disease is to be accepted, there are other causes that must be considered to have at least equal value. Chronic irritation, for instance, especially for many epithelial carcinomata, seems to be an indispensable predisposing condition. Without the preparation of soil, developed by frequently repeated irritation, the epitheliomata fail to make their appearance." This calls to mind what a famous pathologist, W. T. Councilman, said twenty-five years ago—"We are still very much in the dark as to the etiology of tumors. It is certain that we must look to the tissues themselves. There must be some predisposition of tissues. Given predisposition, another factor is necessary, and that is irritation." So it is brought to our attention by the best of authority that whatever the predisposition to lesions and neoplasms we must after all come to the belief that in local irritation is found the prime factor in the etiology of necrobic processes in the jaws if we are to be in harmony with the conclusions of the most careful and diligent scientists on disease.

Dr. Kirk in the article before referred to eliminates all factors in the causation of pyorrhea save a depraved tissue brought about by tissue starvation and intoxication "which renders the individual vulnerable to the invasion of disease-producing bacteria," and says that "we must seek to remove the constitutional vice before we can successfully treat the disorder." Nothing is mentioned of the inciting factor—chronic repeated continued local irritation, which for nearly a half century has stood as the prominent factor in the etiology of diseases in the same class as pyorrhea.

A few other writers and speakers hold the same views, but I give special notice and reference to the expressions of Dr. Kirk on account of his ability and his repeated statements concerning the points mentioned. A logical putting together of etiologic factors in diseases similar to pyorrhea, and careful observation and clinical treatment of a large number of cases, convince me and many observers that Dr. Kirk and others have erred and that their postulates have discouraged attempts at treatment which if intelligently per-

formed would have been successful. Thousands of teeth are lost yearly by the ravages of this disease, and it is my belief that such a deplorable condition is largely due to the dissemination of statements that the cause is in a constitutional vice and that cures cannot be effected without systemic treatment. This has led many practitioners to entirely ignore local treatment and to tell afflicted patients that curative efforts will be of no avail. It is the bounden duty of every member of this national body to correct this error so that the public may find the best possible relief from this destruction of the dental organs.

Discussion. *Dr. S. J. Spence,* Chattanooga, Tenn.: I wish to urge the importance of dentists being able to diagnose tuberculosis in the early stages. Often we have a better opportunity to do so than physicians. To say nothing of our duty to humanity, our own lives are at stake, for a tubercular patient over whom we are working can by coughing throw these germs of death into our throats and lungs.

Dr. M. L. Rhein, New York: I do not believe that Dr. Kirk or any of the men who take a similar view of the etiology of these diseases has ever intimated that this condition could be satisfactorily cured without proper local treatment or removal of every point of irritation. Everyone whom I have heard discuss this subject from the standpoint of Dr. Kirk has thought that in the serious cases which result in the loss of teeth the irritation is produced primarily through systemic disturbances, and whatever means may be used to remove these points of irritation locally they are futile unless the systemic conditions are relieved or eradicated if possible. This is the point which Dr. Patterson seems to have lost sight of. It is a question whether it is feasible in many cases to remove the pathogenic systemic conditions, and in such cases it is not denied that only constant local attention will keep the teeth in such mouths in position. To illustrate clinically what I have said I might cite a case which Dr. Colson related to me—one of which I have met many duplicates. The patient suffered severely from pyorrhea alveolaris, obtaining relief of only short duration until he began general treatment by means of daily enemas, cleaning out the lower intestine. In a short time all irritation of the peridental tissues ceased and the mouth remained in a condition of health until the enemas were discontinued, when the local condition of pyorrhea

returned. This case is but one of many where the local condition of irritation was primarily due to autointoxication—one of the most common causes of this trouble. The point which I wish to make clear is that it is not denied for an instant that the mere treatment of autointoxication for such evils is insufficient to bring about a relief of the local condition. It is taken for granted that everyone realizes that thorough local treatment, especially as to removal of every extraneous point of irritation, must be most faithfully attended to if the patient is to be benefited. The fact nevertheless remains that however thorough and complete this local attention may be, and however beneficial the results may show, these benefits will be only transitory unless the systemic cause has been properly diagnosed and treated.

Dr. Patterson, closing discussion: Dr. Rhein is in error concerning my views. I agree with him most heartily that pyorrhea is often lessened when attention is given to systemic treatment, but I disagree with Dr. Kirk when he says that a cure cannot be effected without such treatment. Dr. Rhein's criticism is also in error, in that I did not say that Dr. Kirk limited his treatment to the constitutional phase, but that he did say pyorrhea could not be cured without systemic treatment. I hold that in faulty metabolism or any predisposing condition which results in faulty metabolism this condition increases the disease in so far as this predisposition exists, which is true for all diseases, and I claim that, given these predisposing conditions, there must be, as the best pathologists of the world have told us, that local chronic continued irritation before the class of diseases typified in pyorrhea can exist. Given the predisposing condition, which is so great a factor in the ravages of pyorrhea, and which so greatly militates against its cure, I believe there has never been a case of pyorrhea of any description without the local condition of irritation. From the best history I can obtain and the best physical examination I can make, the great majority of patients whom I treat for pyorrhea are absolutely without general faulty metabolism.

SALIVA.—It is a fact worth noting that each individual's saliva is not dangerous to himself, even in wounds elsewhere than in the mouth, though this secretion would be perilous to another individual. Probably the reason for this is a continual inoculation.—R. H. M. DAWBARN, *International.*

WATER—ITS ACTION ON DIGESTION AND ITS INFLUENCE ON SALIVARY SECRETIONS.

BY ALBERT E. SAGER, D.D.S., ROCHESTER, N. Y. READ BEFORE THE ROCHESTER DENTAL SOCIETY.

My attention was first directed to this subject by the diversity of opinion existing among people in general, as well as among professional men, as to when water should be drunk, how much, the results, etc. I looked up the matter to satisfy myself as to whether my previous teachings had been correct, and if not, to set right those who had placed themselves under my professional care. My observations and experiments have led me to look upon this subject of water as one of great importance.

Recently I took dinner at the home of a friend, and about the only thing we lacked in the way of food was water (for I maintain that it is a food). Not being accustomed to going without it I asked for some, and my request was granted, with the explanation that it was never put on the table because it was so bad for indigestion, from which both host and hostess suffered. On asking the identity of their informant they mentioned the name of a prominent physician whom they had questioned particularly on this point. I remarked that possibly their physician was right, but that I knew of many examples of the opposite practice, people who rarely ate a meal without drinking from one to three glasses of water, and that indigestion was to them a thing unknown.

Now, what is the action of water in digestion, and why should we drink it with our meals? In the normal act of deglutition water is not essential, the saliva (if the supply is not too scanty) performing its function of coating the bolus of food without additional aid, and it is not until food reaches the stomach that the real needs or benefits of water are manifest. Food should not be washed down with water, but water should follow after it has been swallowed. The food passes into the stomach in the form of a bolus, mixed with the secretions from the mucous and salivary glands, and soon becomes a semi-solid mass by the churning action of the stomach, which begins as soon as the food enters. If water is taken at this time the work of the stomach is greatly facilitated. Water is not absorbed in the stomach from the process of digestion, which is well, for if it were the chyme would become too small and too concentrated, the stomach too soon empty, and the intestines thereby

overloaded. Water passes into the small intestine, where the real work of digestion takes place, with the chyme, diluting it and making digestion and assimilation much easier. The selective property of the cells of the villi of the intestinal walls is also enhanced if the chyme be in solution and not too concentrated.

Now what is digestion? It is the process by which the alimentary principles or foods are prepared for the tissues, in which insoluble substances are made soluble, nondialyzable materials are made dialyzable, albumens are changed into peptones, sugar into dextrose, starch into maltose, etc. These changes are brought about by physical and chemical means, the physical processes being chewing, insalivation, swallowing and maceration. The chemical changes are brought about by the digestive secretions or juices, the essential constituent of each of which is a ferment or enzyme whose nature is essentially a hydrolytic action, the alimentary principle taking up molecules of water and dividing into two or more new bodies. Here again the necessity of water as an aid to digestion is manifested. The action of enzymes and of bile salts is increased about three-fold by the addition of water. Most of the water is absorbed through the walls of the small intestine, a little through the walls of the large intestine, and if there be any excess beyond the needs of the tissues it passes on with the excreta, and tends to minimize constipation by making the feces softer.

Saliva is a mixed secretion poured into the mouth by the parotid, submaxillary, sublingual, and buccal glands. Its composition is water 99.4, solids 0.5, the solids being mucin, ptyalin, albumen, sulphocyanate of potassium, and salivary corpuscles, which last are nothing but modified white blood corpuscles. Saliva is therefore practically all water, and an increased amount of water taken during meals has had a tendency to help the conditions greatly in cases under my observation where the saliva has been unduly thick, stringy or scanty.

I advocate at least two glasses of water with each meal for all my pyorrhea cases and have found it to be of great help. It seems to act both as a solvent and as a cleanser, and the precipitate and deposits on the teeth are reduced in quantity and made softer, so much so that in cases where they can be reached they can be kept off with the brush. I find that by using Dr. D. D. Smith's method of prophylaxis I can keep my patients practically free from the

recurrence of this distressing condition, and I do not believe the same results can be accomplished in any other way. I cite one case by way of illustration. A young doctor came to me with pyorrhea, almost all the teeth above and below being affected, saliva thick, stringy and putrescent, and breath very bad. His specialty, the eye, necessitated his working close to his patients, and he said he knew his breath was offensive at times, but that he had been unable to find anything to improve it. Several treatments took care of the pyorrhea, but the offensive breath still continued. He remarked that he had to fight constipation all the time, and he drank very little water, so I asked him to try drinking at least two glasses at each meal and note results. He has been doing this about a year and a half and all conditions are much improved. I now have him under Dr. Smith's prophylactic treatment, which has proved to be exactly the thing he needed, and a cleaner mouth and sweeter breath would be hard to find. He reports that the tendency to constipation is much lessened, and that he has gained in weight and improved in general health.

Discussion. *Dr. F. W. Proseus:* I remember hearing the senior DaCosta lecture at the University of Pennsylvania on the subject of lithemia. He cited the case of one physician who thought he was suffering from softening of the brain, and another who believed his heart was affected. DaCosta diagnosed them as cases of lithemia from an excess of alcoholic beverages, and put them on a water diet. He told us that water was one of the best things he could recommend. Lithemia, gout and pyorrhea all come under the same head. I agree with the essayist that people should drink more water, but I do not think ice water should be used or that containing much lime or mineral matter. The physical condition of the patient should also be taken into consideration. In a case such as Dr. Sager cited I should look for something specific in the history of the patient, for ordinarily we do not find such a bad mouth and breath in a young man unless there is something back of it all.

Dr. Smith: Old Dr. Moore used to say that it was contrary to the rules laid down to drink large quantities of water at meals, but that he received benefit from it and recommended it in many cases. He also advised the drinking of water in the morning before breakfast.

Dr. W. W. Belcher: A glass of water the first thing in the

morning is excellent, and after a banquet or dissipation of any kind the night before an attack of indigestion can be averted by drinking water the next morning. In the majority of cases the pain attending the setting of a crown can be immediately stopped by having the patient hold warm or hot water in the mouth. I drink a great deal of water, but believe stoutness is a penalty of it.

Dr. G. B. Mitchell: I do not agree with Dr. Sager as regards drinking at meals, and forty-nine out of fifty physicians advise against it. The average American bolts his food, and the use of water during meals simply helps him to swallow his food without properly chewing it. Water is certainly a good thing for constipation and the majority of people do not take enough of it.

Dr. Sager: Prof. Reichert lecturing at the University of Pennsylvania used these words—"Drink from one to three glasses of water at each meal." Physicians with whom Dr. Mitchell talked must have been of the old school, as the up-to-date practitioners do not hold such views. Experiments in physiological laboratories show that the ferments which aid digestion are increased three to four per cent during digestion by the addition of water. I believe over one-half the cases of pyorrhea are due to neglect, and in some cases they are due to the dentist. Although advocating drinking at meal time, I do not mean that the bolus of food should be washed down with water.

Dr. Mitchell: I had a patient who used carbonated waters and the deposits on his teeth were very hard and brittle. I recommended water with more lime in it and the deposits became less in the mouth and much softer. As regards fifty per cent of pyorrhea cases being due to neglect, a physician in Sweden has effected cures which are to all appearances permanent by using the ultra violet rays and he says the mouths of these patients are the dirtiest in Europe. How do you account for that?

ETCHING ON METALS.—To etch on metals, take one-half ounce of nitric acid and one ounce of muriatic acid. Mix, shake well together, and it is ready for use. Cover the place you wish to mark with melted beeswax; when cold write your inscription plainly in the wax clear to the metal with a sharp instrument; then apply the mixed acids with a feather, carefully filling each letter. Let it remain from one to ten minutes, according to appearance desired, then throw on water, which stops the process and removes the wax.—*Power and Transmission.*

CERTAIN ABNORMAL ORAL MANIFESTATIONS PECULIAR TO TROPICAL AND SUBTROPICAL CLIMATES, AS MANIFESTED AMONG THE AMERICAN TROOPS IN THE PHILIPPINE ISLANDS.

BY JOHN S. MARSHALL, M. D., PRESIDENT OF THE EXAMINING AND SUPERVISING BOARD FOR DENTAL SURGEONS, U. S. ARMY. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT ASHEVILLE, N. C., JULY 28-31, 1903.

My object in preparing this paper is to fulfill a promise which I made to this Association two years ago, namely, to present to you at some future time such matters of general interest as might come under my observation in relation to such abnormal oral manifestations and diseases as are prevalent among our troops in the Philippine Islands. During the last two years I have been stationed at the U. S. Army General Hospital, Presidio, San Francisco, where my opportunities have been exceptionally good for observing the effects of a tropical residence upon the general health of our troops, and particularly its effects upon the teeth and oral tissues. The Presidio is the great receiving station for troops going to and returning from the Philippine Islands. The permanent garrison is large, and the General Hospital the largest of the U. S. Army. The number of sick in the General Hospital varies from five to seven hundred; troops in permanent station between three and four thousand; recruits and casuals, an indefinite number, ranging from three hundred to a thousand or more. The opportunity has therefore been good for making such observations as form the subjects of this paper.

Dental Caries.—Dental caries is generally conceded to be the most common disease with which the human family is afflicted. In the selection of young men for military service in the United States Army physical perfection, or as near thereto as is practicable, is a prerequisite, and it is supposed that the teeth are in good condition when the recruit is accepted and mustered into the service. This, however, is far from being the fact, and can hardly be expected when statistics upon the prevalence of dental caries among American school children show that between thirty and forty per cent have decayed teeth, while the ratio is much higher in those who

have reached the legal age for enlistment. In an examination of more than 7,000 officers and enlisted men I have found but one, a young officer, who was free from dental caries. The Army requirements for enlistment in reference to the teeth are that the recruit "shall possess at least two opposing molars upon each side of the mouth." This requirement the recruiting officers and examining surgeons rigidly enforce, but my observation of the recruits sent to this station has shown that in many cases these opposing molars are badly decayed, having exposed pulps, or are the seat of dento-alveolar abscess in its various stages; while some of the teeth are so badly diseased that extraction is the only remedy. This badly cripples the masticatory apparatus and renders it impossible for these men to properly triturate their food. Under these circumstances it would seem exceedingly doubtful whether such soldiers could maintain their health under the trying conditions of a long campaign in the tropics. These matters were at once called to the attention of the Surgeon General, with the result that greater vigilance has been exercised on the part of the examining surgeons in the examination of the teeth.

There is a general impression abroad that dental caries and other oral diseases present more active or acute symptoms among Europeans or Americans after a more or less prolonged residence in tropical and subtropical climates. This impression is undoubtedly correct, for it has been noticed among our troops resident in the Philippine Islands that a few months after their arrival they begin to complain of oral diseases, while dental caries in particular, and those diseases which are incident to the progress of this affection, such as pulpitis and dento-alveolar abscess, are very common. However, whether this is due to neglect of a proper hygienic care of the teeth during the privations of active campaigning, or to the depressing effects of a tropical climate upon assimilation and vital resistance (thus inducing a perversion of the oral secretions and greater susceptibility to dental disease), or to the necessary changes in the character of the food, remains to be demonstrated. It would seem more than probable, however, that it is due to the effects of all of these conditions combined.

General Miles, in his report to the Secretary of War on his recent visit of inspection to the Philippine Islands, says: "The effect of the climate is a most serious detriment to the service. The men go

there in perfect health and in the prime of manhood, but as a body are seriously affected in the course of two or three years' service. Very few escape, and the majority are debilitated. The effect of the climate upon the families of officers and soldiers is more perceptible. They being the weaker element quickly become a prey to the injurious effects. Many of the officers have been obliged to send their families home, or to a northern climate, like Japan, to recuperate. * * * * * As the military stations with few exceptions are very remote, and the troops are required to be in communities that are neither beneficial nor congenial to them, the service is very depressing, and to some extent has a demoralizing effect. There are scarcely any amusements or recreations for the soldiers, and life under such conditions becomes very monotonous. During my visits to the garrisons it so happened that I did not see a single soldier under the influence of liquor. I visited the hospitals and the guard houses, and in the former I did not find a single case of alcoholism, while in the latter there were but very few men under the charge of drunkenness. While the list of sick is very large, the number of men in confinement was exceedingly small, at some posts and camps not a single soldier being in the guard house. * * * * * While this statement shows a serious condition as to the health of the commands, it is a most favorable report as to sobriety."

The report of the Surgeon General, for the fiscal year ending June 30, 1903, will show that the dental surgeons of the army have operated upon 16,161 officers, enlisted men, nurses and general military prisoners, and that they have treated 45,008 cases of dental and oral diseases, principally dental caries and its sequelæ, and performed 49,483 operations. It will also show that these diseases are very prevalent among our troops, as twenty per cent of the entire army have applied for treatment. There is not a doubt in my mind that if a systematic examination of the teeth of the entire army could be instituted the percentage of those afflicted with dental diseases would be far in excess of these figures.

This report will also show that dental diseases are 18.27 per cent more frequent among our troops in the Philippine Islands than they are in the troops stationed in the United States; while with the troops stationed in Cuba and Porto Rico these diseases are still more prevalent, the per cent being 21.17 higher, or 2.90 higher than

for the troops in the Philippines. This higher per cent for the troops in Cuba and Porto Rico is explained by the fact that among the native Porto Rican troops dental caries and kindred diseases are much more prevalent than among the white troops who were stationed in Cuba.

The following table will show the mean strength of the army during the year 1902, with the number of cases of dental and oral diseases treated by the army dental surgeons in the United States, Philippine Islands, Cuba and Porto Rico, the per cent of cases treated in each of these countries, based upon the mean strength of the troops stationed there, and the total per cent of cases treated for the entire army:

TOTAL DISEASES AND INJURIES TREATED.

	U. S.	Philippine Islands.	Cuba and Porto Rico.	Total.
Mean strength of troops for year 1902.....	39,737	37,768	3,274	80,778
Total of all diseases and injuries treated.....	16,826	26,085	2,097	45,008
Percentage to mean strength.....	42.85%	61.12%	64.02%	55.72%

TOTAL OPERATIONS PERFORMED.

	U. S.	Philippine Islands.	Cuba and Porto Rico.	Total.
Total of all operations performed.....	18,971	28,115	2,397	49,483
Percentage to mean strength.....	47.74%	74.44%	73.37%	61.26%

Pyorrhea Alveolaris.—Another oral disease which is very prevalent among our troops in the Philippine Islands is pyorrhea alveolaris. The forms of the disease which are most common are ptyalogenic calcic pericementitis and phagadenic pericementitis. The first is most often found in the men who are in good health, but who pay little attention to oral hygiene, and many of them claim that they had no trouble with their gums or with the accumulation of salivary calculus upon their teeth until after several months' residence in the Islands. This fact is borne out by the statement of several officers who have always been careful in the matter of oral hygiene, but who have found that a residence in the tropics seemingly induced inflammation of the gums and a greater and more rapid deposit of salivary calculus. This condition, I am inclined to believe, is due to the active, strenuous life which they have led in the field, and the hardships endured while campaigning in a strange country, under harassing conditions, surrounded by a treacherous enemy, and without roads, telegraphs or suitable

transportation. Such a strenuous life of course leads to greater activity in the metabolic processes of waste and repair in the tissues of the body, and under such conditions the calcic carbonates and phosphates are augmented in the saliva as well as in the urine, and the amount of ammonia thrown off by the lungs is also increased, thus favoring an increase in the deposition of salivary calculus upon the teeth. The rapid formation of salivary calculus is indicative of a disturbance in the equilibrium of the metabolic process of tissue waste and repair, or in other words, constructive or synthetic metabolism is not keeping pace with that of the destructive process. The inflammation of the gums which always precedes the deposition of the calcic salts in these cases is also another evidence of disturbed nutrition and lowered vitality.

The hematogenic or gouty form of the disease is rarely seen among our troops who have served in the Philippines, except in a few of the older members of the service who were suffering from the disease when they went out. Warm climates are not conducive to the production of gouty and rheumatic affections, by reason of the more free elimination of the waste products of tissue metabolism through the skin and other avenues of excretion.

Phagadenic pericementitis is very prevalent among those officers and men who have suffered from anemia, typhoid fever, tropical fever, tuberculosis, nephritis, alcoholism, diabetes mellitus, albuminuria and sexual diseases. The etiology of this form of the affection is very obscure indeed. About all we know of it is that it is usually associated with some debilitated condition of the system induced by overwork, debauchery, severe and prolonged illness, or by the exhibition of certain drugs which have a selective action upon the tissues of the mouth.

The disease as it appears in most of the cases that have come under my observation has been of an acute or subacute variety, the teeth having been lost in a few months after they were attacked. I have seen several cases in which all the teeth were lost by the disease in less than two years. These are the cases that are sometimes classed as scurvy in the reports of "Sick and Wounded," and for which soldiers are entitled, under the decisions of the Pension Office, to draw a pension.

Inflammatory and Ulcerative Conditions of the Oral Mucous Membrane.—Inflammatory and ulcerative conditions of the gums

and mucous membrane—stomatitis simplex and stomatitis ulcerosa —are very prevalent among the soldiers who have recently returned from their tour in the Islands. Some of these cases are due to the accumulations of salivary deposits and food debris, in other words, to a bad hygienic condition of the mouth. In other cases, those in which the teeth and mouth are in a fairly clean condition, the inflammation and ulceration seem to be due to a lowered vitality of the general system. It has also been found, in many of the cases of chronic diarrhea and dysentery that have been invalided home and placed in the General Hospital, that ulcerative conditions of the gums and oral mucous membrane are very prevalent. These cases of intestinal disease often make exceedingly slow progress towards convalescence, some of them remaining in the hospital month after month with little permanent improvement.

In a conversation with Colonel A. C. Girard, who was at that time in command of the hospital, I suggested that there might be some important relationship existing between the chronicity of the disease and the unhygienic condition of the mouth, and that it was not improbable that in some of these cases the unclean condition of the oral cavity was a source of secondary infection. He therefore issued an order directing that all obstinate cases of these diseases be sent to me for examination and treatment of any abnormal oral conditions that might be present. In some of the most obstinate cases I found the mouth and teeth in a very unclean condition, the gums inflamed and turgid, the oral mucous membrane inflamed, and in some of the worst cases the mucous follicles were enlarged, forming vesicles which later ruptured, leaving small ulcerated patches, which in the course of twenty-four hours were covered with a curdy white pellicle. These ulcerative patches were exceedingly sensitive to acids and pungent foods or liquors.

The treatment adopted was as follows: After a thorough removal of the salivary deposits found upon the teeth, spraying the mouth with a twenty-five per cent solution of hydrozone, and painting the gums and ulcerated patches with the following:

℞ Tinct. Iodin.....20 c.c.
Tinct. Aconite.....aa

the patient was dismissed with instructions to report for treatment the next day. He was also furnished with a twenty-five per cent solution of hydrozone, and instructed to rinse the mouth with it on

rising in the morning, after meals, and before retiring. The daily treatment consisted of spraying the mouth with twenty-five per cent solution of hydrozone, painting the gums with the iodin and aconite mixture, and touching the ulcerated patches with a ten per cent solution of silver nitrate. This treatment followed for a week or ten days usually cured the mouth symptoms, and almost immediately thereafter the general condition of the patient began to improve, and many after a few weeks more were discharged as convalescent.

This I think proves the fact that in those cases in which rapid improvement in the general condition of the patient followed the cleansing of the teeth and the treatment of the mouth, the chronicity of the disease was due to constant reinfection from the unhygienic condition of the oral cavity. The removal of the salivary deposits and a few days' treatment with antiseptic mouth lotions in the uncomplicated cases always resulted in a speedy cure of the oral symptoms.

Sprue or Psylosis.—Another form of sore mouth, found associated with a chronic catarrhal inflammation of the alimentary tract, with dyspeptic and diarrhetic symptoms, and known in the tropics as "sprue," "psylosis," or "tropical diarrhea," is common among our soldiers in the Philippines. "Sprue" is a peculiar and very dangerous form of catarrhal inflammation involving the whole or a part of the alimentary mucous membrane, chronic in character, and subject to frequent exacerbations of greater or less severity. It is usually associated with a torpid condition of the liver and a suppression of the glandular activity of the mucous membrane of the stomach and intestines, or perversion of the secretions which perform gastric and intestinal digestion. It is a disease peculiar to tropical and subtropical climates, and is more frequently seen among European and American residents than among the native population. Our American soldiers are seemingly very susceptible to the disease, as many cases are reported occurring among them, and a considerable number have been invalided home with the hope thereby of establishing a cure. Many of the latter cases have come under my personal observation, the clinical aspects of which have been studied with increasing interest. The disease is undoubtedly of myotic origin, but no specific microorganism has yet been found which can be positively demonstrated as the cause of the affection.

The predisposing causes are prolonged residence in the debilitating conditions of a tropical or subtropical climate, and such exhausting diseases of the alimentary tract as diarrhea and dysentery. It is not infrequently associated in the female with frequent childbearing, miscarriages, uterine hemorrhages and prolonged lactation. It may also be superinduced by syphilis, by prolonged exhibition of mercury, potassium iodid, alcoholism, overwork, mental strain or anxiety, or "any depressing influence, particularly if it is combined with gastric or intestinal irritation."

Susceptibility to the disease is greater in some individuals than in others, the mental condition seemingly having a marked influence in this direction. It has been noticed that many of the soldiers of our Army who have been attacked with the disease had previously suffered from mental depression due to homesickness or other causes. In some of these cases the disease has developed after a few months' residence in the Islands, while in others not until a residence of one or two years or more. Sometimes the disease does not come until the patient has been home for several months, and in most of this class of cases it develops as a complication of chronic diarrhea or dysentery.

Symptoms.—The general symptoms are soreness of the mouth, painful deglutition, tenderness over the stomach, dyspeptic distension of the abdomen, and frequent diarrheal discharges in the early part of the day, great physical weakness and emaciation, loss of memory, and irritability of temper. The disease is remarkable for its variability in the severity and combination of its symptoms, and in the rate of its progress. In some cases it takes on a subacute form, terminating fatally after a year or two of suffering, while in others, according to Manson, it may drag on intermittently for ten or fifteen years. The prognosis is good in recent cases when proper and prompt treatment is employed and the patient is judicious in his diet, while it is unfavorable in the chronic cases of long standing or in patients in the decline of life.

Oral Manifestations.—The mouth upon examination will present a variety of superficial lesions of the mucous membrane, which vary in their character according to the severity of the gastric and intestinal symptoms. When these symptoms are most pronounced the tongue will have an angry red appearance, with minute vesicles, patches of congestion and superficial erosions upon its edges and

tip. Deep fissures sometimes appear on the dorsum, due to the swelling of the mucous membrane, while the under side of the organ, upon either side of the frenum, will present patches of superficial ulceration, sometimes red, at others covered with a white or bluish-white pellicle, having the appearance of aphthous patches. Similar patches and superficial ulcerations are found upon the mucous surfaces of the lips and cheeks and occasionally upon the palate. Vesicles are sometimes found upon the palate and buccal mucous membrane which rupture and form ulcerated patches, and in the more severe cases the uvula and fauces are red and excoriated, thus making it difficult for the individual to swallow, while the soreness and tenderness of the mouth excites an excessive flow of saliva which, on account of the difficulty experienced in deglutition, dribbles from the mouth. Food is taken with difficulty, while pungent or highly-seasoned foods, wines and liquors, cause pain and a burning sensation of the mouth and tongue, and in some cases pain and the burning sensation are experienced in the esophagus as food or liquids pass from the mouth to the stomach, which is evidently due to the inflamed condition of the mucous membrane of this passage.

The oral symptoms are of such a character that to my mind they point very strongly to a myotic origin, as the white or aphthous patches appear to be composed of masses of the thrush fungus or Oidium Albicans.

In all cases of sprue the oral cavity is invariably in a very unclean condition, the teeth are covered with salivary deposits, food debris and inspissated mucus, the gums are more or less inflamed and swollen, tender to the touch, and bleed upon the least provocation, and the breath and saliva are of a disagreeably fetid odor. In fact, the whole condition is such that it suggests the possibility and even the probability that the chronicity if not the origin of the disease is due largely to this neglected and filthy condition of the mouth.

The menace to the general health through an unclean mouth and diseased teeth is by no means even approximately appreciated either by the medical and dental professions or the laity, as is evidenced by the fact that very few physicians take into account the influence of diseases of the mouth and teeth upon the general health when examining a patient for some obscure disease of the general system.

The oculist, aurist and laryngologist generally appreciate the value of an oral examination in trying to arrive at a correct diagnosis of certain diseases affecting the organs of their special field of practice, but the general practitioner is often ignorant of its value or careless in its employment. Many cases of what have appeared to be due to malarial influences or bad plumbing have been traced to an unclean or diseased condition of the teeth and mouth, while numerous other cases of gastric and intestinal affections have been traced to the same source.

It is a well-established fact that summer diarrhea accompanied with aphthous patches (thrush, or sore mouth), which affects so many bottle-fed children in the foundling hospitals and orphanages of our large cities during the hot months of the summer, is an infectious disease, spread from child to child by the use of unclean nursing bottles, tubes and nipples, and also that by ordinary cleanliness the disease can be prevented. A dirty nursing bottle is clean, however, when compared to the mouth of a person suffering from a severe case of sprue.

With the ordinary soldiers of today a proper care of the teeth and mouth is much neglected, and although they may have been repeatedly instructed by the surgeons and the dental surgeons to keep their mouths and teeth clean, many of them never use a tooth brush or even think it necessary to rinse the mouth after meals. As a consequence the mouths of such individuals are in a very uncleanly condition, and the salivary secretions loaded with microorganisms. The same criticism may be made in relation to many otherwise cleanly persons in civil life, who never visit a dental surgeon until driven to it by severe suffering, and are then astonished when told that *clean teeth do not decay* and that *clean mouths are rarely ever affected with disease.* The task of educating the general public up to a realization of the fact that dental and oral diseases are largely due to a neglect of the simplest hygienic measures lies at the door of the general practitioner and of the dental surgeon, and if we do not teach this in season and out of season we are not performing our duty to our patients nor fulfilling our obligations to the state.

In my offices at the General Hospital I have large cards printed with these legends upon them: "Clean teeth do not decay" and "Do not ask the dental surgeon to treat your teeth until after you

have brushed them," and I have been greatly pleased with the good impression that this information and suggestion has had upon the men, for after the first or second visit there is a marked change in the appearance of their teeth. These men also spread the information among their fellows, and I can already see a marked change in the care given to the teeth by the men of the whole garrison.

Treatment. All authorities are agreed that drugs are of little value in the treatment of the general symptoms of sprue. The greatest reliance is placed upon a change of climate, by sending the patient home or transporting him to a location where the air is cool and bracing, and placing him upon a restricted diet. Most patients do best on a strictly milk diet. In those cases which cannot take milk beef juice is usually well borne by the stomach. Warm clothing and rest must be insisted upon. The local treatment recommended for the mouth has usually been that of swabbing or spraying it with solutions of cocain to allay the pain and soreness while taking food.

I have not found in the authorities consulted that any particular method has been suggested or effort made to change the oral conditions in these cases, as they have not been looked upon as etiologic factors in the disease. This to my mind is a serious mistake, as the unclean condition of the mouth renders it a most favorable soil for the propagation and multiplication of various pathogenic and saprophytic microorganisms which are constantly passing into the stomach and intestines, and cannot be otherwise than a source of continuous irritation and secondary infection.

It has not been my good fortune to see even a single case of sprue in its incipient stage, and I therefore cannot speak with certainty upon the early mouth symptoms, but I am inclined to the opinion, from my observations of the chronic cases, that the primary cause of the disease may be very closely associated with the uncleanly condition of the oral cavity, and that the chronic condition is due in a large measure to secondary infection from the mouth. The latter statement I think is proved by the fact that several of the cases of long standing which have been placed under my care for treatment of the oral symptoms have made very rapid improvement in their general symptoms soon after a clean and healthful condition of the mouth was secured.

My line of treatment has been as follows: 1st. Thoroughly spray

and wash the mouth and teeth with a twenty-five per cent aqueous solution of hydrozone. 2nd. Remove all salivary deposits and food debris from the teeth, place temporary fillings of gutta-percha or zinc oxyphosphate cement in all carious cavities, and extract suppurating roots. 3rd. Cauterize all ulcerated patches upon the tongue, lips and cheeks, with a ten to twenty-five per cent aqueous solution of silver nitrate, and paint the gums once a day with tinct. iodin and tinct. aconite, equal parts. The patient is then instructed to cleanse the mouth after each meal by washing it with a twenty-five per cent aqueous solution of hydrozone, followed by a twenty per cent solution of listerine, using a soft tooth brush, to keep the teeth free from food debris. It sometimes takes three, four, or even more sittings to accomplish a general cleansing of the mouth and teeth, as many of these patients are too weak to endure sittings of more than one-half to three-quarters of an hour in duration. After the mouth has been put in the best possible condition that the circumstances will permit the patient should receive daily supervision of his oral treatment, to see that he is faithfully following instructions, as neglect to keep the mouth and teeth clean is liable to cause a relapse.

In closing I desire to state that I firmly believe with a larger knowledge of the microorganisms that find a habitat in the unclean human mouth, and of their means of propagation, development and dissemination, we shall find that the origin of many diseases and abnormal conditions of the general system, which now appear obscure, have their source of infection in the microorganisms of the unclean mouth, and that in other cases the chronic character of these diseases and abnormal conditions is due to secondary infection from the same source.

EVOLUTION OF TEETH.

BY C. N. PEIRCE, D.D.S., PHILADELPHIA. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT ASHEVILLE, N. C., JULY 28-31, 1903.

That human dentition, in common with that of other mammals, has been evolved from a simple and homogeneous type to a more complex and heterogeneous one, both as regards structure and form, is no more a questionable problem. In this modification of tissue from the simple to the complex, and the arrangement consistent with

function, we must place nutrition and the dietetic habit as important factors.

To consider intelligently the peculiarities of mammalian teeth we must not ignore the primitive mammalian dentition, nor can we neglect our knowledge of the teeth of the mammalian ancestry from which we must closely follow and note the evolutionary changes.

If in our choice we are, as has been suggested, limited to the batrachia and reptilia as mammalian progenitors, then to these animals must we look for our most simple and primitive tooth forms. In referring to these we find them consisting of cone-shaped anchylosed crowns, the number large and variable and the succession almost endless.

Accepting the "dermal denticle" as the immature condition from which all teeth were primarily derived, we have these teeth of the batrachia and reptilia as a step in advance. In certain of the reptilia an evolutionary progress is made, resulting in the implantation of the teeth in distinct sockets, with the addition of a cingulum or an abortive cusp on the crown, and a tendency to bifurcation of the roots by flattening and longitudinal grooving.

From these primitive forms, with numbers, shape and durability so variable, there is much room for modification before we reach the incisors of the rodentia, the sectorial tooth of the carnivora, and the broad, grinding molars of the herbivora, or the comparatively fixed, though less specialized, teeth of man. The uncertainty in the number and in the succession of the teeth of the reptilia, as compared with the two definite sets of the higher mammals, has led to much conjecture regarding the origin of this fixedness, and to an effort to determine whether the deciduous or the permanent set is entitled to the credit of priority in its evolution; also in those mammals which have but one set, whether it is the permanent or the deciduous which has been lost.

In making this mention of the relationship between the permanent and deciduous set one may very pertinently ask: Are the deciduous teeth superadded embryonic structures which subserve a temporary purpose and disappear with approaching maturity, or are they to be homologized with the first set of teeth of the lower vertebrates? The rudimentary condition of the deciduous teeth in some mammals is given as evidence of their transitional character, and if it is true that tissues most recently developed are frequently

the first to be atrophied, it would appear that these are superadded structures, but we must not overlook the fact that the enamel organs of these deciduous teeth arise de novo from the lining membrane of the oral cavity, and that in their evolutionary stage of development, by a process of budding, the enamel organs of their permanent successors arise from the necks of the enamel organs of the deciduous teeth. Another fact in this connection must be mentioned, namely, that the germs of the first permanent molars, by their origin, stand physiologically in the same position as the more anterior deciduous teeth, and that the germs of the second permanent molars arise from those of the first, and the third from the second, just as do the germs of the permanent anterior teeth from the enamel organs of their predecessors. In noting the origin of the first permanent molar it must not be forgotten that all of its associations point distinctly to its being a persistent milk molar.

Minute Anatomy.—Having thus spoken of tooth origin or evolution, I wish to devote a little time minutely to tooth development. The incipient appearance of the tooth is at a time when the mucous membrane covering the jaw is embryonal or gelatinous tissue, when it is a network of branched embryonal cells—a prolongation, as it were, of the epithelium of the surface penetrating the mucous membrane. This prolongation, much thickened at its subjacent end, is the primary enamel organ. This organ at its deep end becomes invaginated by a mass of gelatinous papillary tissue, which constitutes the tooth papilla and which is entirely derived from the mucous membrane. This primary enamel organ is in this manner converted into the true enamel cap which will be the covering of the embryonal tooth papilla.

The gelatinous mucous membrane which immediately surrounds this rudimentary tooth represents the tooth sac. This vascular membrane at first consisting of a network of embryonal cells is soon filled with bundles of fine fibrils, these are grouped into a laminated structure and form a sort of meshwork with one another and complete the tooth sac, which is well defined from the mucous covering.

The connection between the enamel organ and the surface epithelium, owing to the growth of the mucous membrane over the former, is severed at a somewhat later stage.

This vascular papilla, which is covered by the enamel cap, is composed of a network of nucleated cells which gives origin to the pulp,

and through it odontoblasts produce the dentin. The odontoblasts make their appearance early as a stratum of large and more or less columnar cells. These elongate at their distal extremity just previous to the formation of the matrix of dentin. Then the pertinent inquiry is as to the odontoblasts themselves being calcified, or is the dentin matrix an excretion of these elongated cells? It is well recognized that the growth of these cells continues as long as the dentin increases in thickness, and that the most recently formed dentin remains for a limited time uncalcified. This being the case it is easily distinguished from a well-marked boundary line of the older and previously calcified dentin.

There is to-day a seeming uncertainty in the minds of histologists as to the complete disposition of the odontoblastic cells, what part is responsible for the matrix of dentin and what part, if any, persists as the dentinal fiber. It is certainly fair to assume that the odontoblasts proper yield the dentinal matrix, while the dentinal fibers are derived from a deeper, or, at least, an additional layer of processes or projections of the cells. Thus, while the continued growth of the outer extremity of the odontoblasts yields new layers of dentinal matrix, that of the processes of the deeper layer of cells causes the elongation of the dentinal fibers, and enables these to keep pace with the growth of the matrix of dentin.

In the growth of the tooth sac over the enamel cap its connection with the surface epithelium becomes gradually severed. The enamel cap, however, is limited both on its inner and outer surface by Huxley's membrana propria.

The next change that takes place in the enamel cap is a separation into an inner and outer membrane by some flattened cells forming a middle membrane in which no vessels are present. The inner membrane, so called, is in contact with the dentin, or if this is not formed, with the tooth papilla. These cells embracing the inner and outer layer are called by Kolliker the enamel cells and consist of a dense reticulum. Outside of these enamel cells are layers of small cells with a spherical nucleus, which form the stratum intermedium of Hanover.

The outer membrane of the enamel cap is composed of several layers of epithelial cells, but as development progresses the middle membrane gradually disappears and the inner and outer membranes are brought in contact and constitute the enamel cap. The enamel

is now formed from the inner side of this membrane in the same manner as the dentin is formed from the odontoblasts; that is, the extremity of the cells next to the dentin elongates and is directly converted into enamel, or else the enamel is formed as an excretion from this tissue. Waldeyer and Tomes think there is a direct conversion of the tissue into enamel, while Kolliker, Kollman and Huxley think it is an excretion from the enamel cap tissue. The increment or increase of the enamel cells and the conversion into enamel probably occur successively, hence we have the transverse markings of the enamel prisms thus explained. The enamel cells, like all epithelial cells, being separated by a homogeneous substance, it is evident that the remains of this material must be found between the enamel prisms, but in quantity gradually growing less in the fully formed tooth. This interstitial substance is recognized in a degenerating or disintegrating tooth with a tendency to facilitate its disorganization.

In the examination of recently formed enamel we have the appearance of closely packed hexagonal prisms seen endwise, which show an opaque peripheral and a clear central part. This condition is due to the periphery first solidifying while the center for a time remains semigelatinous and transparent. The cells that remain on the outer surface of the enamel give origin to the cuticle found on the surface of enamel. The membrana propria of Huxley, to which we have previously referred as the border line between the enamel and dentin, in fully formed teeth entirely disappears. The tissue of the tooth sac, from which we have the cuticle of the enamel developed, extends down the tooth towards the apical extremity and represents the matrix from which the cement is formed; in both structure and function it is an osteogenetic layer and produces tissue in its activity almost identical with bone.

TENTATIVE DENTISTRY.

BY J. L. SUTPHIN, D.D.S., CANMER, KY. READ BEFORE THE KENTUCKY STATE DENTAL ASSOCIATION, AT BOWLING GREEN, MAY 25-27, 1903.

The old adage—"Necessity is the mother of invention"—has perhaps been as clearly and forcibly demonstrated in the profession of dentistry as in anything else. Many very valuable discoveries have

been made by accident, some of which I might enumerate, but it is my purpose in this short paper to confine myself to the brief mentioning of what I regard as some valuable and useful points which I have solved by studying and experiment in order to overcome some difficult and otherwise annoying cases in my daily practice. Probably there is no practitioner, let him have had years of superior college theory and training, or let him be unlearned, who has not at times studied out some practical methods for making difficult cases easy and simple. Perhaps the man who is most lacking in a knowledge of his profession has as a rule been more apt in inventing methods for an easy solution of difficulties than the one full of correct theory and practical training, for the former's lack of professional knowledge and other advantages would often undoubtedly place him in a position where he must invent or discover something for overcoming obstacles or fail of success to his discredit as a practitioner and to his pecuniary loss. However, it is my purpose to present to you some points which perhaps even some of our more learned men in the profession have not particularly thought of, or, if thought of, have probably not regarded as sufficiently practical when brought to their notice.

With these preliminary remarks illustrative of the facts just named I now call your attention to a method (which might be more properly given in a clinic) for successful gold filling in connection with cement. Many times in the past when I have cut cement fillings out of cavities, many of which were in teeth of poor structure, I have wished that we could put in gold fillings that would have the firm and durable attachment to the walls of the cavities that the cement fillings would have. After thinking over the matter at intervals for several years I decided recently to experiment with gold and cement in combination. The thought was not so much one of recent date, but I had failed to use the two in connection, holding the belief that gold could not be successfully employed with any liquid or semi-liquid preparation, and therefore could not be used with cement until the latter had become hard. About a year ago I had a case in which the lower incisors were badly decayed on both approximal surfaces and could not be shaped well for the firm retention of gold fillings. The patient did not want the teeth extracted, notwithstanding that the molars were all gone, and wanted gold fillings, even if the teeth could be preserved by them only a

few years. Of course, I was anxious to fill them, as I am much opposed to extraction when it can be avoided, so I cleaned out and shaped up the cavities as well as possible, and filled them with gold, using the utmost care in every particular. A little later, however, two of the fillings came out in consequence of their not being well anchored. I studied over the case for some days and finally concluded to experiment with gold and cement combined, after a plan many times suggested to my mind. The work was a success, and since then I have put in many gold fillings by this method in inaccessible and badly shaped cavities, with much satisfaction to myself and my patients.

My plan consists of placing a thin mix of cement in the cavity, and then immediately putting a piece of well-annealed mat gold over the cement, extending it over and across the entire cavity, and pressing the gold with suitable pluggers carefully over the whole surface, carrying it well up into curves and other anchor points if present. Only a little time will be consumed in the operation. After this I proceed in like manner with one or more pieces of gold until the cavity is nearly filled, then take a small excavator and carefully remove every particle of cement that may have been pushed out and be adhering to the edges of the cavity. Meanwhile the cement under the gold has become firm enough to allow the use of the mallet to some extent, and with the gold cemented in place I proceed to build on it in the ordinary way to the completion of the filling, now using any form of gold preferred. The soft cement will adhere well to the walls of the cavity and to the gold in contact with it, and being more or less confined and under pressure at the start will set very dense.

One might suppose that the liquid in the cement would penetrate the gold and prevent proper adhesion of subsequent pieces, but such is not the case, for the cement being a chemical union and strongly adhesive within itself, the liquid portion will not separate from the mass and penetrate the gold. I have also put in amalgam fillings with success in connection with soft cement. The use of cement in this manner prevents thermal shocks to a certain extent, and obviates discoloration of dentin and enamel when amalgam is used. Furthermore, the cement is a desirable medium between gold and enamel where the dentin has been entirely removed by caries or otherwise. In addition, much cutting of tooth substance for grooves

or anchor pits can often be dispensed with in very sensitive teeth to the great relief of the patient (and operator as well), which in many instances is absolutely necessary if the work is to be done at all. I might state that before inserting the cement I apply oil of cloves to the cavity, wiping out the excess. This aids in preventing destruction of the pulp by the phosphoric acid or other harmful agents that may be in the cement, and the oil will also prevent recurrence of decay to a greater or less extent.

It must not be assumed from the above remarks that filling teeth by the method given tends to slovenliness or requires but little skill. Nothing must be overlooked or neglected in the preparation of the cavity, so far as the removal of decay is concerned. To thoroughly remove the cement and fill in well about the edges of the cavity with gold requires more skill than filling with gold in the usual way, especially with many approximal cavities where little space is offered.

I will next relate an experience out of the ordinary, which would perhaps not be of special value in general practice, but it is suggestive of the importance of inventive study when emergencies arise. Recently a former patient, now living some fifteen miles away, wrote and telephoned several times, urging me to come to her house and do some dental work for her and some of the neighbors. I finally consented to go, notwithstanding that the roads were very bad and I was really not well enough to go out in the inclement weather. I found it necessary, in addition to doing much other work for my patient, to construct two banded Logan crowns. I made the bands and soldered on the caps with my small spirit lamp without any trouble, but then discovered that I had forgotten to bring my gasoline furnace and so could not solder the porcelain investments. I was in a dilemma, for my time was limited, the distance too far to send for the furnace, and much too far for me to go home to do the soldering and then return, so after some little thought I finally improvised a substitute for investing and heating up which proved successful. I sent my patient's husband to the barn for some fence wire, from which I cut off a piece of about two feet in length and twisted it to proper form at one end to receive the investment. I had previously made up a good fire in the grate, which now had burned down to a bed of live coals. I placed the investment deep down in the coals and awaited the result with some misgivings. The investment got red throughout, but the

solder would not flow, so taking my blowpipe, constructed from a bicycle pump, I placed myself before the fire (seemingly to an outsider in the attitude of a Hindoo bowing to Mecca) and began coaxing the flow of the solder with the blowpipe, using, of course, the flame of the coals. About the time my face had assumed a color resembling that of the coals, and the watery elements of my body were beginning to form little rivulets down my anatomy, the solder flowed, and after that the work was easy.

I will now give a method which I have studied out for making cast aluminum plates conform to the palate of the mouth when lacking in close adaptation. Some of you will perhaps remember that several years ago I became very much interested in the Streetman method of casting aluminum dentures, spending some time in the Streetman laboratory in Cleburne, Tex., in aluminum work, and I became fairly proficient in it. Later on I made many plates for my patients, but occasionally one would fail to conform properly to the mouth—to "go up" well. I could not afford to dismiss my patient with a badly fitting plate, and it was a great deal of trouble to cast another, especially as the same fault might exist in it. After some studying I conceived the idea of swaging the plate at the rear of the palatal region and thus producing a good adaptation if possible. With this plan in view I poured plaster on the palatal surface of the plate, letting it extend up pretty high for special strength, and after it had become well set I removed it and cut away at the rear of the plaster model to a depth of from one-sixteenth to one-eighth of an inch, gradually sloping to the surface to within one-sixteenth of an inch of the air chamber part, and gradually sloping in like manner to the maxillary ridge. I then placed the plaster model thus altered in position, and with a horn mallet swaged the plate where most needed, trying in the mouth now and then and always observing the fit with the mirror. By this method I obtained good fits where otherwise the plates could not have been worn at all. I may add parenthetically that rubber plates can be pressed down after the same method by immersing them in very hot water and using a rounded piece of wood wrapped in cloth to prevent bruising. It would be well, however, to flow plaster around the teeth so that they might not become loosened in any way.

Before leaving this topic I would caution those who do not use cast aluminum plates constructed after the Streetman method not

to attempt to swage them as herein indicated. Some months ago I was away from home and sent to a laboratory in Chicago for a set of teeth on a cast aluminum base. It did not fit well, and I attempted to swage it as I had those of my own make, but it broke into several pieces and presented a granular appearance. The flask or investment was evidently subjected in the process of molding to the same intense heat as the metal, which made the plate very brittle.

With a brief description of how I was relieved of much useless labor and the loss of much valuable time by a simple experiment, I will bring this paper to a close. Some months ago, when on a professional visit to a town in my county, just as I was about to return home a lady came in for a set of artificial teeth. I had only one set in my stock of the proper size, and they were much too yellow to suit her complexion. I did not have time to order a set of suitable color and then make a full upper and partial lower for her, and as she had a very small face and mouth and a short, thin upper lip, I much preferred setting up the teeth on wax, trying them in the mouth to see if correct in every way and completing the dentures and adjusting same before leaving for home. I studied for some time as to whether or not it was possible to change the color of the aforesaid set, and finally concluded that by grinding I might reduce the yellow to the proper whiteness. I therefore set to work, and by using carborundum wheels, emery and cuttle-fish disks, etc., in the engine I soon brought the teeth to the proper color. I presumed that the enamel of the teeth was thin and added after the body was baked, and that by grinding it could be taken off and the teeth be brought to the desired whiteness, in which belief I was correct, although it was purely an experiment with me. As a result I was enabled to use a set of teeth that I had had in stock for years because of their being so yellow, and it was possible for me to have the patient on hand to properly adjust the work in the mouth. In this particular instance it was well that the patient was near me, for had I made the plates at home and sent them to her they would not have had such an accurate fit and nice appearance, her mouth being a difficult one to suit.

WASHING SODA (SODIUM CARBONATE) INJURIOUS TO ALUMINUM INSTRUMENTS.—The ordinary washing-soda solution in which instruments are boiled will entirely ruin aluminum instruments, and hence should not be used for sterilizing them.—*Inter. Jour. of Surg.*

A PLEA FOR INCREASED ATTENTION ON THE PART OF STUDENTS AND PRACTITIONERS TO "MECHANICAL DENTISTRY."

BY C. M. WRIGHT, A.M., D.D.S., CINCINNATI, OHIO. READ BEFORE THE NATIONAL DENTAL ASSOCIATION, AT ASHEVILLE, N. C., JULY 28-31, 1903.

Natural teeth are a twentieth century luxury and not a physiological necessity. This remark was made in a paper on Riggs' disease, read at the tri-state meeting at Indianapolis, June, 1901. It was not a reckless or casual statement, but the result of a good deal of perplexing thought. The perplexity and the thoughts were forced upon me by an extensive observation of many mouths, bristling aggressively with the products of modern dentistry, and yet in a condition of profound sepsis. Oral hygiene and oral physiology had evidently never been taken into account by the dentists when they inserted their operative marvels.

We have always within easy reach proofs of the improvement in local and general health from the insertion of entire artificial dentures. We see numbers of teeth in crippled and diseased conditions which are retained by desire of the patient and acquiescence or solicitation of the dentist, which twenty-five or thirty years ago would have been surgically removed without a protest, and the question must arise, did the older dentist have a broader conception of the importance of maintaining the "physiological balance" in his patients than does the practitioner of to-day, with his complex notions about contour, and crowns and bridges?

In a recent paper I related the case of a brother and sister, eighteen and twenty years of age respectively. The boy had been to some gas establishment and had every tooth extracted. I was called upon to insert full plates mounted upon vulcanized rubber. The sister had been and still is struggling with a marked predisposition to caries, pericementitis and gingival weakness, and has chronic discomfort from her teeth and gums. She has some forty fillings, four gold cap-crowns, a viscid saliva, congested gingival margins, and many loose teeth. Her breath is often fetid. The brother, with his clear eyes, rosy cheeks, and mouth and breath like a baby's, is a constant example to the sister of the superiority of

artificial teeth for use, comfort and cleanliness, to say nothing of expense.

The boy's case is an unusual one in this day of dental service, though less uncommon forty or fifty years ago. In those days men like Allen, Hunter, Corydon Palmer, and other fathers in dentistry considered the construction of artificial dentures as a *sine qua non* of the dentists' art. These men could be found daily at the foot lathe, at the molding table, at the forge and anvil, at the furnace, at the kiln—all in the legitimate line of practice in the profession.

They called it mechanical in distinction to operative dentistry. Then came the era of the operator, with the neglect of the laboratory. The building of cohesive gold into corners and cusps filled the minds of practitioners, to the practical exclusion of the mechanical part. Laboratories were banished from first-class dental offices, and the demands of people in need of substitutes for lost teeth were met by a separate class of men, whom the profession tried to ignore and unwillingly regarded as dentists at all. To be an "operator" was the ambition of the student and of the practitioner.

A third of a century ago, when I "held the chair of mechanical dentistry" in a "dental college," a senior class sent a protest to the board of trustees against the rule of the college that a certain time each afternoon should be devoted to laboratory work. One reason offered for the protest was, "that mechanical dentistry was becoming obsolete; that it would not be necessary for the future dentist to know how to swage gold plate, mold zinc dies and solder metals." At that time the dentist expected to know how to take an impression of the mouth, as this was operative in character, so that if he meddled at all with the inferior and degrading branch he might send to some laboratory workman and have the masticatory machine made to measure, just as the oculist sent his prescriptions to the optician, and the surgeon his maimed patient to the artificial limb manufacturer. The dentist was to be known as an operator and not as a mechanic.

Another era came, and gold crown and later "bridge" cases became popular. Then the dentist fitted up small laboratories or ornamental benches which could be placed in corners of the operating rooms, and began to do with his own hands the finer, smaller mechanical work of swaging, soldering and fashioning these caps

and crowns and bridges. For "plates" he still sent to the common laboratories.

The porcelain era seems to have come upon us now, and skill is gradually being directed away from the gold contour and the gold crown and turned toward this cosmetic (?) dentistry of refined mechanics.

During these later eras or waves of fashion in dental art there still has remained a large and constantly increasing demand for artificial teeth mounted on plates. A high degree of mechanical skill is required in this department, and in no other work of the dentist can the artistic taste be exercised to such advantage.

That this noble art has been neglected by the better class of dentists for a quarter of a century is apparent in the mouths of Americans. We have fallen behind other nations, especially the English and the French, in this art part of our profession. Our position in regard to biology, microscopy, special therapeutics and general pathology places the dentist on a footing with the best medical specialists. We have reason to be proud of many logically conducted scientific experiments strictly within the limits of our professional work during the last few years, and the time has arrived when the broad-minded dentist, with his expanding knowledge, should be able to reason clearly and estimate correctly the value of the various kinds of service the dentist can offer to the world.

He should be able to overcome a fad, a rage, a fashionable demand of the day, whether this has arisen from men specially skilled in some one department, or from easily influenced patients. His judgment should declare positively in favor of wholesale extraction and entire artificial dentures when necessary to the best physiological condition of his patient, no matter what the habit and thought of the profession or people may be. Health, usefulness and beauty are frequently better conserved and more easily promoted by skill in this neglected branch of dentistry than by the most modern inventions for the retaining of natural teeth.

As keen observers of all conditions pertaining to the mouth and teeth, and with a picture of an ideal physiological state of oral secretions and soft tissues, and a knowledge of the systemic effects of pathological oral conditions, what value can we place upon a tooth *retained* by ligature? Of a gold crown upon a tooth with a pus-forming pericemental membrane? Of a bridge resting on sup-

purating piers? Of an inlay decorating an invalid and useless tooth?

We have made wonderful progress in the direction of saving teeth from the forceps, but we are violating a fundamental principle in surgery and a basal proposition in pathology. For these reasons I should urge an awakening from its long sleep of the old era of mechanical dentistry, and this in the interests of health and esthetics.

The lengthening to four years of the dental college course seems to me to furnish the opportunity for this. Two full years of the course should be spent in the laboratories. No boy should be allowed to pass into the junior class, nor into the operating rooms until he has become an expert mechanical dentist. A two years' apprenticeship to the art of manipulating gold plate, silver plate, cast plate, vulcanite and continuous gum is all too short for the large majority of students. Even the shoemaker and the tailor require a much longer time before they can make by hand their products.

When we consider the impression-taking and the prosthetic adaptation for restoration of the functions, the two years of laboratory work does not seem adequate. We have not referred to the art part at all. This in itself is worthy of a life's best work. The dental student should be an apprentice to an art as well as a student of a science. Mechanical dentistry is not removed from surgery or medicine so far that it need be looked down upon, and it is so near to art that we should be proud to cultivate it.

CUTTING-EDGE MOLARS AND BICUSPIDS.—Walter Whitehouse (*Record*).—After several years' experience the author has confirmed his previous conjecture that a more or less sharp cutting-edge in lower dentures, meeting the flat surface of the upper molars and bicuspids, would be more efficacious for mastication than the usual somewhat flat surfaces meeting together, which crush rather than disintegrate food. Mr. Whitehouse has had several opportunities of trying this method, and patients that have been wearing plates thus constructed speak of them with distinct approval. The most important advantages claimed for this method are that the lower sharp teeth cut and disintegrate meat better, that there is more room for the tongue, and no overhanging ledge for the tongue to touch against and disturb the lower denture. It also enables a "raised bite" to be more quickly and easily adjusted by grinding the narrow lower teeth, which still retain their cutting properties, in contrast to the flat surfaces which are produced when the ordinary molars and bicuspids are ground, destroying their utility.

Digests.

TECHNIQUE OF PORCELAIN INLAY WORK, WITH SPECIAL REFERENCE TO CAVITY PREPARATION AND RETENTION. By Rodrigues Ottolengui, M.D.S., New York. Read before the Maine State Dental Association, July, 1903. The utilization of porcelain for the filling of teeth has now become something more than a mere fad, and promises to occupy henceforth a prominent place in the daily work of the dentist. Introduced at first almost purely for cosmetic reasons, its advocates have discovered in it properties which make it preeminently the only choice in many of the most serious cases with which we deal—cases wherein the appearance is of only minimum consequence. I allude specifically to those large cavities which approach the pulp so closely that metallic fillings become a menace to that organ. In the past

Fig. 1.

the dentist, recognizing the danger of using metals over closely approached pulps, and having no non-conductive filling at hand which would prove permanent, has been compelled to choose between pulp removal, and temporary work, the hope in the latter instance being that Nature might relieve the difficulties of the problem by means of secondary dentin. This is a hope that has often been blasted, the patient returning with the pulp dead and putrescent conditions, if not alveolar abscess actually present. In such predicaments the inlay workers have turned to porcelain and have found the problem's solution. Porcelain therefore is to be counted not merely as a beautifier, but likewise a saver of teeth—and indeed it is a tooth saver for exactly those teeth that most require salvation.

A great deal has already been written in relation to this topic, and I mean no disparagement to any of the writers when I say that the great majority of the papers thus far have been but empirical descriptions of personal experiences, which nevertheless have proved most helpful to those entering the field. Nor is it strange that this should be true, when we remember that in spite of the many serious and scientific attempts which have been made to establish a one

best method of filling teeth with gold, there are still quite contrary claims made in relation to cavity preparation in connection with the use of that metal. I must admit, before others bring the accusation, that this paper like its predecessors from other pens will be largely empirical records of personal views; moreover, I shall not even commit myself to final adoption of those methods which I advocate, though I shall give reasons for my views, while reserving the right to alter my opinions during the next year as I have materially done during the past twelve months. In relation to cavity preparation it is my purpose to call attention to certain principles which seem to be important, and to ask that what I have to offer be accepted merely as a contribution to the knowledge of the subject and for the consideration of the systematist who will, in the near future I hope, take up the whole subject of preparing cavities for

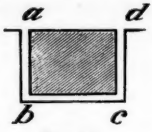


Fig. 2.

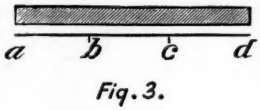


Fig. 3.

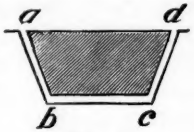


Fig. 4.

the reception of porcelain and so deal with it as to lift it from the slough of empiricism into the solid realm of scientific methods.

Principles of Cavity Preparations for Porcelain.—The first consideration in this problem is in connection with two important facts, which of themselves separate the use of porcelain from that of the more usual modes of work. These are, first, the cavity must be of such a shape that the filling may be inserted in it as a single mass; second, an intermediate substance must be used, the matrix, which, however, is discarded when the filling is placed. A third and important fact which, however, is subsidiary to the two already mentioned, is that retention is largely dependent upon a cementing medium. Some may deny that this is of secondary importance; I consider it so only in the study of cavity preparation, because it is used for a similar purpose in the older methods of filling. Or to make myself clearer, the use of cement, while important in connection with the shaping of cavities, has a bearing of less influence than the other factors enumerated.

Taking up the points seriatim, let us study the condition resulting from the fact that the filling of porcelain is inserted as a single

mass. This at once precludes the possibility of absolute mechanical retention. It does not, however, render mechanical retention completely impossible. I have elsewhere described a dovetailed form of cavity which affords considerable mechanical retention, the filling sliding to place as a cover in a grooved box. This style of cavity is rarely useful, but there are places where it will be found of inestimable value.

The fact that the cavity cannot be made absolutely retentive completely does away with a problem which has long bothered the workers with gold. In the effort to obtain retentive shapes the earlier operators resorted to grooves and pits which frequently left walls so fragile that the forces used subsequently in malleting the gold into place, or later still during mastication, resulted in fractures, with either loss of the filling or recurrence of decay. In this dilemma a solution of the difficulty was sought, and the more modern doctrine looks to success with the square seat and the occlusal step, with strong walls and cavity margins, and very slight grooves. This system of cavity preparation is applicable to porcelain work to a degree that would surprise those who have not made the attempt, the main departure being in the absence of undercuts and the arrangement of the actual cavity margins. Two axioms seem safe for adoption in all cavities where the inserted filling must resist the stress of mastication; the use of a broad and as far as possible square seat in the incisors and cuspids, and the use of the same form of seat together with the occlusal step in bicuspids and molars. When I speak of the seat as broad I mean through the tooth mesiodistally, and by square I mean that the marginal line from buccal to lingual aspect must be as nearly straight as possible, the gingival angles of course being slightly rounded. The seat being thus broad and square it may be made either flat, rounded or grooved. The grooved form where the tooth is pulpless, thus allowing sufficient tooth bone for forming the groove without weakening the gingival border, will materially assist in attaining retention.

Cavity Margins.—With this principle well comprehended let us take up the preparation of a central incisor in which the pulp is alive, but which contains a cavity requiring the restoration of the full corner. It has been common practice and has often been advocated that the margins of such a cavity should be prepared at right angles with the labial and lingual surfaces (Fig 1: cross-section

through central incisor), this being usually effected with fine disks, it being carefully observed that the disk should be so held that the enamel is made absolutely flat without bevel in either direction. I have filled a great many teeth in this manner, but from experience I am now satisfied that it is a grave error, and one which largely accounts for joints not being as satisfactory as they should be. My attention to this was first attracted by the following unpleasant incident. A patient was sent to me by a brother practitioner in order that I might restore a large corner broken from an enormous central incisor. I prepared the cavity as was then my custom (Fig. 1), the enamel margins being at right angles to the labial and lingual surfaces, and made and inserted a filling. Six weeks later I saw the case, and was astounded to note that the joint appeared as a fine line drawn with pen and ink, due to a staining of the cement with nicotin. It would be reasonable for some to imagine from this state-

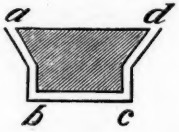


Fig. 5.

Fig. 6.

ment that the adaptation of the inlay must have been bad, to leave so much cement in the joint that it could be stained. *Prior to setting the inlay,* however, when merely pressed to place in the tooth the joint appeared invisible and the adaptation perfect. It was set with a thin cement, force being applied continuously for fifteen minutes until the cement had hardened. I have therefore concluded, in my own analysis of the case, that the fault was not in the inlay but in the form of the cavity, and to make my point clear in this connection I must take up the second factor, the influence which the matrix must have upon cavity preparation.

Influence of the Matrix.—In the discussions as to whether gold or platinum should be used much stress has been laid upon the alleged fact that gold could be used *thinner* than platinum. In my opinion it is not the *thickness of* platinum which renders it less useful than gold, for *few inlays are set with a stratum of cement which is as thin as the matrix.* Nevertheless it is possible to so arrange a cavity that, while at all other parts the cementing medium surrounding the inlay may occupy at least as much or even more space than

did the matrix, along the margins the joint may be made so close that the space will be considerably less than the thickness of the matrix material, and in some cases may even be brought into actual contact. [The underlying principle now to be discussed was communicated to me by Dr. J. E. Nyman in conversation.—R. O.]

You will please imagine a cavity having the shape of a perfect cube, that is to say, with sides actually parallel with one another and rising at right angles to the bottom (Fig. 2). Suppose this box-shaped cavity to be evenly lined with a layer of either gold or platinum, and this lining removed without alteration of shape, to be used as a matrix. Then suppose that the porcelain is accurately fused, producing a perfect cube. If we strip the matrix from this cube of porcelain and drop the same accurately into the cavity, examination will show that it can be brought into *actual contact* with the bottom or floor, but that space will exist at all four sides. Lateral movement will bring the block into contact with two other sides in addition to the floor (the space at the opposite sides of course being doubled), but no manipulation will produce contact at all four sides. Thus the margin must of necessity be open as wide as the thickness of the matrix throughout one-half of the margin at least.

This shows that in cavities surrounded by tooth substance, as in approximal cavities in incisors which do not reach the incisal angle, as well as in labial cavities, the preparation of margins at right angles with the adjacent surfaces is erroneous. We have seen that the cube dropped into the box comes into actual contact with the bottom. It follows that if the sides are flattened out to the same plane (Fig. 3), a mass of porcelain fused on a piece of metal which had been adapted to such a surface would come into contact throughout. Thus it follows that the nearer the sides of a cavity approach the same plane as the floor the more accurate will be the adaptation of the porcelain to the cavity surface. But this flattening of the cavity leaves us more and more dependent upon the cement for retention, since the flatter the surface the less mechanical source of retention we will have. There is little doubt that the first form, the cubical cavity with sides at right angles to the floor, will afford the greatest opportunity for retention; the second, where the cavity is entirely flat, offers the least retentive quality even though it gives us the closest joint.

If we form the cavity with the walls inclined at an angle of forty-five degrees (Fig. 4) we make a compromise. The retention is worse than in the cubical form and better than in the flat, but conversely, the joint is better than in the right-angled cavity though worse than in the flat. If an inlay for such a cavity is dropped into place till in contact with the bottom (b to c) the space left at the margins (a and d) will be just one-half the thickness of the matrix used. It therefore follows that if the bottom of the inlay be ground off to the extent of half the thickness of the matrix the whole inlay may be brought into contact with the cavity at all parts.

Influence of the Cement.—For a moment it would seem that this is the best result obtainable; but further analysis shows that it is not, and here we come to the influence upon cavity preparation which the cement will have. We have shown that in the first cavity, the cube-

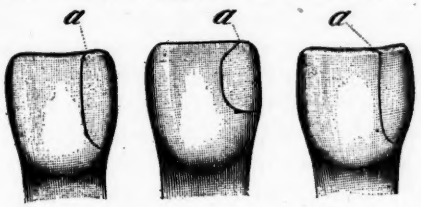


Fig. 7. Fig. 8. Fig. 9.

shaped, the inlay can be brought into contact with the floor (b to c), but this is true only in the absence of an interposing substance. If cement be first placed in the cavity, the cubical block of porcelain can no longer with reasonable force be pressed against the bottom, because the lateral walls rising at right angles (angles a b c and d c b) will imprison the cement between the inlay and the cavity bottom and prevent its displacement. Thus this form of cavity, though having the greatest powers of retention, will nevertheless produce an inlay surrounded by the maximum quantity of cement. In the flat cavity the greatest quantity of cement can be displaced, as exit is afforded at all sides, so that the thinnest residuum of cement would remain at the joint (a and d) and between the inlay and the cavity surface. In the third form, where the walls are made flaring at an obtuse angle, we would be able to displace a greater portion of the cement, because of the lessened resistance of the walls, than in the case of the cubical form, and we would get a much closer joint, but we would have at the same time less retentive strength.

Can we do even better than this? I have said that analysis shows we can. We may do this by inclining the wall to only one-half the depth of the cavity (Fig. 5). Thus the lower part of the inlay would fit as did the cube, while the upper part, with the walls now flaring off, would give us opportunity for a closer joint along the margins. The resulting inlay would have a form diagrammatically similar to the head and part of the shank of a screw. Theoretically this would not obtain so good a joint as where the flare of the walls reached fully to the bottom, because the lower right angles would still imprison the cement and prevent forcing the inlay tightly to place. Practically, however, this is overcome by grinding from the extreme bottom of the inlay so that contact along the flare of the walls could be reached before the actual bottom of the cavity was touched. In practice also we would not have actual angles.

These, it must be understood, are *underlying physical principles.* Their application to practical work must be modified to meet the characteristics of the material with which we deal. For example, however desirable it might be theoretically to flare the walls to an inclination of forty-five degrees, in many instances this would produce too weak an edge of porcelain. Judgment must therefore be used, and the departure from the right-angle formation must depend upon the masticatory stress which is to be met.

Restoring an Incisal Corner.—Applying these principles to the practical management of the cavity under consideration, the incisive corner of a central incisor, we find that by examining a diagrammatic cross section of such a cavity prepared with the margins flat, and at right angles with the labial and lingual surfaces (Fig. 1), we meet the same obstacles in setting the inlay as were discussed in connection with the cubical form. (Fig. 2.) The cement is not easily displaced because of the angles and the resistance of the flat surfaces. Thus we have a joint with a maximum of cement interposed. If after this mode of preparation we stone away the angle of enamel nearest to the dentin, that is to say, flare the margins from the dentinal surface out towards the labial and lingual surfaces (Fig. 6), we approach the screw-head formation (Fig. 4), which, we have seen, gives us the best attainable resistance coupled with the closest joint. Indeed it is possible with judicious grinding of the inlay, substance being removed from all parts except the absolute margin, to produce an inlay which will be in contact along the

margins, while sufficient cement is imprisoned to hold the inlay in place. In dismissing this phase of the subject I will say that I have during the past winter been practically utilizing these principles with the result of vastly improving my margins, after setting. Of course any well made inlay will show a beautiful margin prior to the interposition of cement.

A second point to which I wish to call attention may be discussed in connection with this same incisive corner restoration. Consider now the point of contact between inlay and tooth at the extreme incisive edge. It is customary to prepare this place also at right angles to the labial and lingual surfaces (Fig. 7) with the enamel left flat from dentin to the outer surface. Again we find the obstacles to a close joint, because of the difficulty of forcing the cement from between the two flat surfaces, that on the tooth and the corresponding place on the inlay? What is the result? Within a year the patient discovers a slight crevice at this location due to the washing out of the excess of cement. If permitted to remain some fine substance (as in biting a thread) may enter this crevice (Fig. 7 a), producing a disaster. Or it may be necessary from time to time to use a disk, which slowly but surely shortens the tooth. Where the labial and lingual plates are left on the same plane it is well to use small stones and bevel off this point from the outer edge of enamel inwardly (Fig. 8). This, however, is not the best course, since too much beveling would weaken the enamel (Fig. 8) so that it might be chipped under the stress of mastication. The remedy here brings us at the same time to a discussion of the best formation for retention of these incisive corners.

The cavity preparation which does not afford a broad seat gives us a shallow cavity, in which case almost our whole reliance must be upon the retentive strength of cement, which will be all too little. With a broad seat the stress of mastication is transmitted through the long axis of the inlay to this solid base against which the inlay rests, and thus the broader the base the less liable the disturbance of the inlay. In broadening this seat of course there is a limit to extension pulpally. Considerable extension, however, may be made at the linguo-gingival angle, the lingual enamel being freely removed at this point until a firm seating is had. The lingual enamel may then be removed as far as permissible from this point towards the incisive edge, so that when we reach the latter situation a line

connecting the labial and lingual plates of enamel would cross the incisive edge diagonally (Fig. 9 a) rather than at right angles, as heretofore advised. In a cavity thus fashioned the lingual surface of the inlay would be much wider than the labial; thus in addition to the advantage of the broad seat we have the labial plate of the tooth resisting the pressure brought against the lingual surface of the inlay, which now resists the stress because of the extension of the cavity on that side. There will be a closer joint along the incisive edge because of the slant at that surface, and with less reason for the cement to wash out the open joint is less noticeable to the tongue even should it occur, which is improbable. Likewise it is not likely that thread or other substances could do damage.

In the case of devitalized teeth the extension at the lingual aspect would sometimes bring the inlay quite to the median line of the tooth, the extension, however, being greater towards the gum than at the incisive edge. In this form of cavity a deep groove may be cut to serve as the seat, which adds greatly to the retentive strength. If gold be used matrices can be made for such cavities so that a great depth of the inlay rests within the cavity proper.—*Items.*

CAVITY PREPARATION FOR PORCELAIN INLAYS IN THE SIX ANTERIOR TEETH. By Dr. William H. Cudworth and Ernest J. Eisen, D.D.S., Milwaukee. Literature upon the subject of porcelain inlays is certainly not lacking in volume, and much that is before us at the present time is of creditable character, being the work of thoughtful, painstaking, and conscientious men. As we have learned, however, to regard certain rules in cavity preparation as logical and indispensable, so we must also recognize specialization of different kinds of work, and should come to some understanding as to what rules must be applied in such cases.

The fact that men who have well-defined ideas regarding the preparation of cavities for gold and alloy fillings can so easily depart from those lines when they take up porcelain as a filling material can be accounted for only by the fact that most demonstrations of the various porcelains have been made by commercial men, who not only had no well-conceived plan of cavity preparation, but wished the making of a matrix and inlay to appear as a most simple matter in which methods of procedure were of little consequence. Anything like permanence, however, can be obtained only by the formation

of cavities so shaped as to be correct from a mechanical standpoint.

To many one of the apparent advantages of porcelain fillings is the ease with which they can be made; this idea, however, in the inexperienced, will lead to the most dire results, and one may ask in all good faith why the impression prevails that an inlay is expected to be retained in place through contact and the adhesion of a very thin layer of cement when no efforts have been made to get even the semblance of a cavity for its retention.

Preparation of Cavities; Agencies for Retention of Inlays. No text-books, we believe, attempt to discourage the idea of shallow and rounded cavities for inlays, and they devote but meager space to a chapter on porcelain fillings in general. When the ideas of operators differ as to the advisability of inserting porcelain fillings which include the incisal edge, one cannot expect a text-book to include an

FIG. 1. FIG. 2.

Front view. Side view. Labial view.

elaborate treatise upon methods for the preparation of cavities for inlays. But the fact remains that innumerable practitioners are today inserting porcelain fillings in the anterior teeth which include the incisal angle.

By persistently adhering to certain rules, and by paying that attention to detail which is more important in work of this kind than in any other, we believe that porcelain fillings rank in most cases with any other material as far as permanence is concerned. The fact that there is so little tendency to a recurrence of decay can be accounted for by the free use of cutting instruments, thereby removing all infected structure and reaching the zone of cleanliness.

Those who have been successful with porcelain inlays attribute their success not to any peculiar advantages of the cement in retaining them in position, but to the adequate cavity formation. Whatever good qualities porcelain may have as a filling material vanish entirely where the preparation of the cavity has not been given that consideration which is absolutely required. Believing that the preparation of a properly-shaped cavity is the prime requisite for

success, we will now endeavor to advocate the merits of certain principles in the construction of porcelain inlays.

In advocating the preparation of cavities along certain lines we must take into consideration the means whereby we are to get a correct impression of a cavity. Certain authors have advocated an elaborate system of cavity preparation, with the expectation of using a die and counter-die to obtain a correct adaptation, but we believe that a cavity simple enough to allow the burnishing of a matrix is preferable, and therefore we claim that any cavity here described can be properly and accurately reproduced through either gold or platinum foil.

Inlays with pins as the agent for retention have their advocates. Except in incisal restorations these are to be condemned. A pin adds but little in the way of retention and lessens the inherent

FIG. 3. FIG. 4.

Front. Side. Front. Side.

strength of the inlay, the weakening being almost in ratio to the size of the pin.

Cement plays a great part in the success of porcelain work, and but for it inlays would still be in an undeveloped state; yet its many good qualities must not be overestimated. It must not be expected to overcome the faults of poorly constructed inlays, nor to accomplish the impossible, and should not make us forget principles which stand at the head of dental science today. We therefore consider that a cavity should have such depth and angles that too great dependence be not placed upon the retaining powers of cement. Dislodgment of an angular substance is less likely than of one with a round surface. Shallowness and round surfaces to facilitate the removal of a matrix should be discouraged as the worst possible practice in porcelain work. In addition to their advantages in the retention of inlays, angular cavities have other properties which make them desirable.

Relation of Color to Shape of Inlay. An angular mass of porcelain enamel can be more readily made to assume the color of the tooth. When a ray of light strikes upon the outer surface of the

inlay it is transmitted through an equal thickness of the translucent porcelain, an equal amount of light is absorbed in the various portions of the porcelain, and we have a uniform amount of light reflected from the posterior flat surface of the cavity. Not so, however, if the surface of the cavity be concave. Here the amount of light returned from the cavity surface of the thinner edge of the inlay is greater than that reflected from the apex of the concavity, and consequently the color impression created in the eye of the observer is not uniform, but varies with the thickness of the porcelain body through which it passes.

Another point may also be considered. As is well known, the angle of refraction of light from a plane surface is equal to the angle of incidence. In the square cavity we are dealing with plane surfaces; the direct rays of light strike upon the porcelain, pass

FIG. 5.

Front. Side.

through this translucent substance, and strike the plane surface of the cavity, from which they are reflected in parallel lines, *i. e.*, returned directly to the eye. In the round cavity we are dealing with a spherical reflecting surface, and the ray of light passing through the porcelain is not returned in a parallel line, but makes an angle with the incident ray, and is returned to the surface at a different point from that of its entry. Thus it is very evident that the problem of the refraction of light is more easily solved by the angular than by the round cavity.

Classification of Cavities. A well-defined idea of the amount of tooth-structure to be sacrificed, the angle at which the matrix is to be withdrawn, and the point at which force will be applied when the inlay is in place, are the factors to be considered as the basis for each individual case.

In the preparation of cavities upon the labial surface of teeth the profession at large has used a method which is as sound today as ever, its simplicity making anything else impossible. The formation of such a cavity with a fissure or other flat bur has given us a flat base and straight walls. No variation in the preparation of such

cavities, nor the presentation of a different method, is here contemplated.

Cases of this nature have proved by years of eminently satisfactory service that porcelain has a place in dentistry, and today the only point of difference in the minds of the profession is to what extent porcelain should act as the restorative agent for lost tooth-structure.

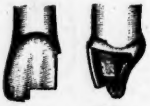
Including the incisal angle commensurate with the amount of tooth-structure lost or to be sacrificed for the strength of the inlay, we classify approximal cavities in three divisions: (*a*) Simple Approximal; (*b*) Approximo-incisal; (*c*) Compound Approximo-incisal.

(*A*) *Simple Approximal Cavities.* The presentation of a simple approximal cavity calls for no definite variation in shape. In the majority of cases we will find that the area of decay has extended lingually, hence the destruction of the lingual plate of enamel is

FIG. 6.

Front. Side.

FIG. 7.



Front. Side.

obligatory. The preparation of the cavity first requires the destruction of the lingual plate of enamel and the removal of all decay with excavators; an inverted-cone bur is then used to cut a seat at the gingival portion of the cavity at right angles to the axis of the tooth, and with this as our foundation, all other surfaces of the cavity should be cut at right angles or perpendicular to the gingival seat. The cavity as shown in Fig. 1 is ordinarily preferable, but where decay has not progressed extensively we may allow the lingual wall to remain as in Fig. 2.

(*B*) *Approximo-Incisal Cavities.* Approximo-incisal cavities differ in shape where the position of the tooth and the amount of separation are to be taken into consideration. However, space is generally limited and the withdrawal of the matrix requires consideration. Hence the cavity in Fig. 3 fulfills the conditions. When the teeth are in juxtaposition and the incisal angle is involved, separation being obtained by mechanical means, the cavity would present the appearance shown in Fig. 4. Often an inlay is indicated where separation is unnecessary, space being present through vari-

ous causes. In such cases an ideal cavity may be prepared, as shown in Fig. 5.

(*C*) *Compound Approximal Cavities.* Compound approximo-incisal cavities may be formed in a manner to overcome all weak points where direct force is met with. As a rule the conditions necessitate their formation as in either Fig. 6 or Fig. 7.

Approximate cavities in cuspids are classed as simple, no other designation being necessary except in isolated cases of restoration of the tip, where the general procedure is similar to the reproduction of the incisal angle in incisors. The irregularities in the shape of cuspids, however, make it quite impossible to recommend a cavity preparation suitable for all cases. Fig. 8 shows a most favorable preparation, and where applied it has proved the most successful.

The advantages of cavities formed upon a mechanical basis may be summarized as follows: The base is directly opposite the point

FIG. 8.

Approximal view.

at which force is applied; it is secure against the stress of lateral force; the point of greatest resistance is at the linguo-gingival angle. The refraction of light can be more definitely estimated and controlled by the symmetrical formation of flat surfaces in the cavity. Cement is relied upon only in so far as its qualities are known to recommend it.

Accurate adherence to the principles here set forth is not always feasible, but in the majority of cases it is believed that cavities formed upon these lines will lead to greater success in the construction of porcelain inlays than will result from cavities formed without definite principles as to construction and which depend upon cement for retention of the inlay.—*Cosmos.*

A PLEA FOR THE LARGE MOLAR IN DENTAL PROSTHESIS. By Dr. Stewart J. Spence, D.D.S., Chattanooga, Tenn. In nature the human molar measures across its occlusal surface about seven-sixteenths of an inch, measuring about the same mesio-distally as bucco-lingually. In art the molar usually measures about

six-sixteenths of an inch mesio-distally and five-sixteenths of an inch bucco-lingually. The difference, therefore, between the occlusal area of the natural molar and that of art is about as 7×7 to 6×5—that it, as 49 to 30—a great discrepancy on the part of art. The artificial bicuspid is usually about as broad as that of nature when measured mesio-distally, but very commonly falls short in the bucco-lingual measurement, being often only three-fourths and sometimes but two-thirds the correct width. When to this is added the fact that the artificial denture excludes entirely one large tooth, it is seen that the grinding surface of art is somewhat less than half that of nature.

The writer can well remember the surprise with which he gazed upon these diminutive molars in the infancy of his professional life. He gazed and wondered but said nothing, supposing that since the manufacturers made them so there must exist some good reason why they created them so small—inscrutable and past finding out though it was. And this became an article of faith with him—*simple* faith! Indeed, it was with a feeling of venturing upon heterodox and dangerous ground that he timidly began in course of time to discard the small molars from the sets of fourteen and substitute for them larger ones. And now it transpires that a veteran of renown in plate work, Dr. L. P. Haskell, has been demanding through the journals why manufacturers make such small molars, and the answer has been that the profession at large calls for them. The profession at large has perhaps been governed by the before-mentioned article of faith. If any of its members have offered any scientific reasons for their choice, such reasons were not repeated in the reply made to Dr. Haskell. It is reasonable to infer that the profession called for them because the manufacturers made them, and that the manufacturers made them because the profession called for them.

Probably the root cause of this long reign of the small molar is that in the early years of tooth-manufacture porcelain teeth were made only for the metal plate, being attached thereto by solder, and that as very painstaking grinding was required to adapt the porcelain to the metal in such a way as to exclude oral débris, this fact furnished a fair excuse for the narrow tooth. The practice being introduced in this way, its years of use fixed it into a custom, and customs are tyrants whose dynasties often outlive the needs which called them

into existence, in this case swaying the dentist's judgment when the advent of vulcanite removed the original reason for the use of the small grinding tooth.

Arguments Advanced for the Employment of the Small Molar.—The only arguments put forth from a scientific standpoint in favor of the small molar, as far as the writer has heard, are (1) that it renders the vulcanite plate less apt to fracture, because permitting more vulcanite in proportion to porcelain; (2) that it is more incisive than the larger tooth, so cutting deeper in mastication, and (3) that the larger molar encroaches more on the room of the tongue.

The first of these three objections may be disposed of by answering that the vulcanite may be thickened and thus rendered sufficiently strong. Nor is there any difficulty in doing this, because these fractures are most apt to occur where alveolar absorption has made room for an abundant thickness of vulcanite—that is, at the buccal surface, and where restoration of contour is needed to avoid sunken cheeks. Indeed, the fact that plates are often deficient in bulk at these regions is an argument in favor of the large molar, seeing that its greater size tends to fulness here. And this it does without interfering at the same time with a correct position of the tooth for masticating purposes—as does not the small molar.

To explain: In positioning an upper molar on a plate two desiderata should be aimed at—first, the support of the cheek by placing the tooth as far outward as is well possible, and second, the stability of the plate during mastication by placing the tooth as directly under the ridge as is well possible. Now it is obvious that these two conflicting desiderata cannot both be obtained by the use of the small molar, because of its narrow diameter bucco-palatally, so that if it be kept snugly under the ridge in order to obtain stability of the plate during mastication there results depression of the cheek, and if it be extended outward to prevent this depression the result is that its palatal cusps, on which the burden of mastication falls, are positioned out from under the ridge, and the plate consequently becomes liable in biting to tilt loose on the other side of the mouth. The greater breadth of the large molar more nearly allows the attainment of both these desiderata.

The large molar also tends to prevent another too common error in plate work—the unduly closed bite. I think most of my readers will agree that more plates present with bites too close than too open.

In these cases the molars are usually to be seen protruded toward the cheek, more inclined than perpendicular to the ridge, and so nearly on a level with adjacent vulcanite surface that the portion of it which extends towards and over the tuberosity sometimes does more service in mastication than do the misplaced and diminutive molars. The anterior teeth are similarly protruded, thus bulging out the lip as shown in pictures of Washington, while being scarcely if at all ever visible, and obliterating all traces of Cupid's bow which time may have spared, while at or near the angles of the mouth appear deep wrinkles formed by the tissue folding at each of the unduly deep closures of the jaws. To add to the unsightliness the bicuspids (and of course the molars) are too prominent, giving the appearance of a mouthful of teeth. In biting these plates are more easily loosened than those whose teeth lie more nearly under the ridge. The large molar, by obstinately objecting to being pushed thus far from its proper position on the ridge, tends to prevent in the hands of the unskilful workman this undue closing of the bite.

The Second Argument.—The second of the three above-mentioned arguments—that small molars are more incisive—is more plausible. Its advocates argue that it receives weight from the fact that the full power of the muscles of mastication cannot, as Dr. Black has shown, be employed with teeth set on plates, because of the discomfort caused the membrane by heavy pressure, and they claim that the bites of the smaller tooth under this lesser pressure masticate the food better than those of the broader tooth, because they are more penetrating. Some go so far as to say that the larger tooth increases this discomfort to the membrane in proportion to its size, but this is surely erroneous. It is easy to understand that a diminution in the size of the plate may increase this discomfort, but how the size of the tooth can affect the matter, seeing that the tooth merely conveys the pressure, is—at least to the writer—incomprehensible. But that a small body will penetrate more readily than a large one is of course self-evident, and if other things were equal this would be a weighty reason for using the small molar, but there is another factor in the calculation equally self-evident, namely, that the smaller tooth fails to include in its grasp at occlusion so large a quantity of food as does the larger one. With food difficult to penetrate, such as leathery beefsteak, this fact might be but little argument in favor of the larger tooth, and perhaps the small molar might

be indicated, but most food is not very difficult to crush, and *the danger is not so much that it will not be bitten into deeply as that it will not be bitten at all.* Corns of maize, for instance, are easily crushed by a single bite, but that they do not always receive even this single bite is evident from their not infrequently passing through the alimentary tract unbroken. Such fruits and vegetables as are commonly eaten uncooked, *e. g.*, apples, celery, radishes and onions, are very apt to be gulped without sufficient crushing, and yet are not difficult to crush if only they are once gotten between the teeth. And it is, in the writer's estimation, more important that vegetables should be crushed in mastication than flesh. This he infers from the fact that the carnivora chew their food but little, the herbivora much. It is probably more dangerous to swallow an unmasticated piece of onion than an unmasticated piece of beefsteak. The writer knew a young girl who for nine days carried a slice of dried peach in her stomach, then vomited it. Would a piece of the most leathery beefsteak have stayed there undigested that length of time?

But more: Of late years a new factor has entered into the problem. Bonwill has shown that small molars render scientific articulation impossible. He has taught us that at each lateral movement of the mandible the cusps of the molars and bicuspids will, if properly articulated, remain in contact with opposing teeth, and in order that they may do so the teeth of one jaw must correspond in size with those of the other, and if both are small, the result is that the parts which should remain in contact during the grinding bite are carried beyond and away from each other, so ceasing to occlude or doing so at only small portions of their surfaces. Any dentist who has set up both small and large teeth by the Bonwill system knows from experience that it is much easier to get scientific occlusion with the large ones.

And further: The small molar usually will not reach sufficiently far back to admit of that curve in the line of occlusion which when given to artificial dentures adds so much to their usefulness by preventing a dislodgement of the plates at their posterior borders when the mandible is slightly protruded and the incisors are brought in contact tip to tip. The degree of this curve is governed by the amount of overbite, and when this latter is at all large there is needed more stretch of line of molar-occluding surface to properly give this curve than two short molars allow. The manufacturer not only throws out

one molar altogether, giving us fourteen teeth to a set, instead of the sixteen of nature, but he also makes the two remaining molars much shorter than the natural ones. Unless, therefore, the dental mechanic adds a third molar of the smaller kind, he ought at least to give to the two he retains a sufficient backward reach to produce properly this desirable simultaneous occlusion of incisors and last molars. If the attempt be made to produce this curve with two small molars, the curve must in consequence be made quite acute (unless the overbite be very little), and this abruptness tends to displace the upper plate in biting by forcing it forward, just as does a tilted inferior third molar when an artificial upper molar has been made to occlude with its inclined grinding surface.

The small molar has forced itself into bridgework. Here it frequently appears looking almost comically diminutive alongside some great gold-clad natural molar. The reasons given for its employment are (1) that breakages occur less frequently with it than with the larger tooth, and (2) that it does not so much task the roots of the abutment teeth, the bite being lighter. As for this latter reason, it appears to be the same fallacy as that which we touched on before, and may be answered in the same way—that a small tooth will convey pressure equally with a large one. The former reason—that of breakage—is more serious, but may be answered broadly that the bridge ought to be made stronger, not scrimped in size. The argument that a large tooth is more subject to strain because its greater breadth gives more leverage force to a bite falling on its extremities, buccal or lingual, is true only of bar bridges, whose supports are at the median line of the occluding surface; it is not true of bridges supported on gold crowns, where the entire crown forms the support. Such argument would have force only if the dummy crown were wider than that of the abutment. However, it is probable that the failures of large teeth in bridges are not so much due to the size of the tooth *per se* as to the fact that a large tooth, if not artificial *à la* Bonwill, is generally more apt than a small one to occlude wrong in lateral bites, because of its cusps rising higher, so that the whole weight of the lateral bite falls on an over-high cusp instead of being distributed over several teeth. This malocclusion can and should be avoided.

The Third Argument.—It remains only to consider the third and last objection to large molars—that they interfere with the tongue

by encroaching on its room, especially in the lower plate, thus tending to displacement of the plate by the tongue. Now, if the tongue lay below the level of these lower molars it would be apt to occasionally raise the plate, but the tongue—at least the edge of it which comes in contact with the lingual surfaces of lower molars—rests about on a level with these molars, and therefore if it at all affects the plate's stability it is as likely as not to affect it beneficially by holding it down. Besides, as usually made the lower molars of plates do not approach the tongue as nearly as do the natural ones. Absorption of alveolus affects this. A glance at an inferior maxillary bone tells us that the posterior alveolar process and its teeth are placed, not at the center of the bone, but entirely on one side—the inner—even leaning over in that direction. When absorption of the process has occurred the dentist is naturally led to place his teeth over the bone and not in the position vacated by the process, and so he places them farther apart than is natural and gives to the tongue more room than it really needs.

Whether these artificial molars *ought* to be thus placed wider apart than were those of nature is another question, aside from the present subject. This much, however, may be said upon it: As alveolar absorption occurs in the upper jaw on the buccal surface and in the lower on the lingual surface, it results that an effort on the part of the prosthetist to gain stability for his plate by closely following the ridge in positioning his teeth will cause his two dentures to cross each other at the second bicuspid or first molar; which arrangement has this objection, that it shifts the burden of mastication in each case from that side of the molar which is nearer the ridge and throws it on the other side—on the buccal cusps in the upper plate and on the lingual cusps in the lower—with the obvious result that stability is not conserved.

Conclusion.—To sum up the claims for the large molar: (1) It permits restoration of contour while preserving stability of plate in biting better than does the small molar. (2) Its wider grasp of food in eating is of more value to man, because of his being largely a vegetable eater, than is the superior incisive action of the small molar. (3) It better admits of scientific articulation.

There are perhaps little less than five million dental plates, not to mention bridges, in these United States, many of which are worn by the aged and infirm, whose weakened powers of digestion need all

the aid that art can render, and it is no trifling matter if we, the dental profession, are depriving these needy ones of some of the aid they might derive from us if by a greater fidelity on our part to the teachings of nature we furnished them with larger bicuspids and molars. —*Cosmos.*

SOME FACTS AND PHASES OF SYPHILIS THAT INTEREST THE DENTIST. By Don M. Graham, M.D., D.D.S. Read before the Detroit Dental Society, January 14, 1904. While this paper is but a digest of what has already been written on this important subject, some attempt has been made to present such phases and facts as would be of special interest to the dental practitioner. The writer has now learned, what most of you already know, that human nature is not prone to parade its misfortune before the public. He therefore fears that his paper will not be profusely illustrated by living pictures.

Were I to say that the average dentist in Detroit recognizes not more than one or two cases of syphilis in the course of a year, I should feel that the members of this society would agree with me, while the reply from our medical brethren would be, I fear, "because you are unable to recognize it." So eminent an authority as Dr. Osler says, "There are probably more families with a luetic than a tubercular taint." Statistics are incomplete, but probably not less than 2 per cent of the inhabitants of civilized countries are suffering from one form or another of this disease, while in some semi-civilized countries as high as 25 and 30 per cent are sufferers, and of this large number of cases we are told that not less than 25 per cent are contracted innocently. This is enough in itself to commend the subject to our thoughtful consideration, that we may become equipped in the best possible manner to prevent the spread of this dread disease.

Syphilis may assume the inherited or acquired form. The manifestations of the latter are evident in the new-born, which is poorly nourished, emaciated, and often with blisters on wrists and ankles. If the infant be born plump and healthy the inherited taint shows itself usually within four to eight weeks by a coryza or "snuffles," and a faulty nutrition. The lips and angles of the mouth are fissured and ulcerated. The secretions from these lesions, being very virulent, are the source of infection to the wet nurse and others, while

the mother enjoys perfect immunity while nursing and handling her child. If the child lives to the age when his permanent upper centrals erupt we generally find the typical "screw-driver" or Hutchinson teeth; these are somewhat rounded and peg-shaped, tapering from gum to cutting edge. This type of tooth is not an infallible evidence of congenital syphilis, but it is said that if with this we have keratitis and middle-ear disease a positive diagnosis of hereditary syphilis may be made.

For the sake of convenience, the description of syphilis is divided into three stages—primary, secondary and tertiary. The primary lesion usually begins as a red papule, which after a few weeks slowly ulcerates in the center, forming an indurated base of grisly cartilaginous consistence, hence the name hard or indurated chancre. The chancre is usually single and may partake of the nature of the abrasion where infection has taken place, thus a fissure, ulcer or vegetation may somewhat alter the form of the chancre. Accompanying chancres we usually have glandular enlargements; with genital chancres we have inguinal enlargements; with labial or lingual chancres we have submaxillary or sublingual enlargements, which follow in a few days after the appearance of the chancre. They differ from the infectious enlargements in that they are indurated and freely movable, and are neither painful nor inflammatory unless secondary infection ensues.

In from six to twelve weeks constitutional symptoms appear, which mark the beginning of the secondary stage. These may appear insidiously or suddenly, as after a hot bath, alcoholic stimulation or violent exercise, as cutaneous eruptions. It is with the secondary stage that the dentist is mostly concerned, and of all the symptoms the mucous patches are the most characteristic and diagnostic, and the most evident to the dental practitioner. In one important point syphilitic lesions differ from other cutaneous lesions in that they are seldom attended by subjective symptoms, although often extensive. They are rarely accompanied by local inflammations, although fever and anemia are frequently features of the disease. The contour of syphilides is often suggestive. In single lesions or in groups of aggregate lesions, whether of mucous patches or cutaneous eruptions, we often see the circular conformation. Mucous patches, ulcers and scars often observe the curve or segment of a circle, or assume a serpiginous aspect. The mouth lesions are but manifesta-

tions of the explosion which is elsewhere expressed in skin eruptions. As cutaneous lesions are often difficult of diagnosis, so also are these epithelial lesions.

It is the syphilitic behavior rather than the syphilitic lesion that guides the diagnostician, and the dentist should confirm or allay suspicion by a careful consideration of all the evidence that can be brought to bear on the case. This embarrassment and delicacy frequently can be avoided by communicating with the family physician, who should be ever willing to cooperate with the dentist in this matter, and who owes it to the dental fraternity and the community to convey such evidence to the family dentist, that he may be able to prevent infection. On the other hand, if the dentist be the first to suspect syphilis he should refer the patient to a competent physician, instead of treating mouth lesions, as I have known some dentists to do.

Beginning with an explosion of general or secondary syphilis, we have a pharyngeal or nasal blush often extending to the tonsils and interfering with swallowing, occasioning sometimes a hoarseness and cough. These patches form on the mucous membrane and indeed on all moist surfaces of the body. They are but papules moistened, macerated and flattened by juxtaposition of neighboring tissues. These roundish or oval lesions are flattened or slightly depressed, pale-rose or whitish spots, and although they are generally characteristic and diagnostic of syphilis, they should not in themselves warrant a positive and conclusive diagnosis. They should be carefully differentiated from simple aphthous patches, caused by indigestion and local disturbances, such as smoking or macerations from biting, etc. In external features these patches may very closely resemble each other, but only in syphilis have we systemic infection. Of simple aphthous sores we have for the most part singleness and generally exquisite tenderness, with mucous patches multiplicity is the rule and much less soreness, although with secondary infection soreness may be a prominent symptom. Cankers, linear streaks and bands are often found on the inner cheeks representing contact of upper and lower teeth on these tissues, while behind the lower third molar, representing contact by upper third molar, we sometimes find a lucoplastic area, but careful examination will always reveal the true nature of such lesions.

The tertiary stage, consisting of gummata, visceral syphilis and

sequellæ, is not of so much interest to the dentist since the danger of infection is almost *nil.* He is very rarely called upon to replace tissue which has suffered necrosis, since early and proper medical treatment is sufficient to prevent such a catastrophe. In neglected or unfortunate cases, however, a vulcanite plate gives much satisfaction and comfort to the unfortunate, as in the case of a perforate palate.

In concluding this paper, which is primarily of dental interest, I would suggest that we remember the prevalence of this disease and its awful consequences. While all instruments coming in contact with the tissues of the mouth should be thermally sterilized at the end of the day's work, especial precautions should be taken where syphilis is suspected. Hands should be disinfected, and instruments should be boiled for at least twenty minutes in a solution of carbonate of soda, which serves the double purpose of dissolving fats and preventing instruments from rusting. It has been advocated, and I think wisely, that two sets of instruments should be kept, the one employed exclusively in infected and suspected cases. The extra set does not necessarily entail much expenditure, as only temporary work need be attempted during the few months the syphilitic lesions are most numerous and the virus most virulent. A few burs, scalers and excavators are all that are necessary. With modern scientific methods of treating this disease, the teeth of the syphilitic should require no more treatment than the non-syphilitic, although all broken-down teeth should be extracted and necessary fillings inserted with some of the plastic or easily inserted materials.—*Register.*

SURGERY VERSUS EMPIRICISM. By B. Holly Smith, D.D.S., Baltimore. Perhaps no more salutary advance in dental teaching and practice has been made than the substitution of surgical methods in the removal of the dental pulp for the old-fashioned empirical one of "destroying the nerve," yet it is apparent to all who will observe the high-sounding testimonials given so freely by members of our profession to nerve pastes and mummifying mixtures, that at least a large proportion of our practitioners either fail to appreciate the advantage of surgical methods or are unwilling to take the pains to pursue them. In the early editions of the *American Journal of Dental Science* we find letters from the then most successful practitioners describing the novel advantage to be obtained

by the application of arsenic to the dental pulp, ascribing to it the wonderful quality of entirely relieving any sensation in the pulp, and preventing its annoying complainings after filling. The arsenic was simply applied and the tooth subsequently filled without any effort at pulp removal. No explanation of the action of the drug was attempted, but the practice of its application has been followed from that day to this. The *modus operandi* varied somewhat, but always was accompanied with the same empirical spirit of ignorance of anything more than the fact that "it has killed thousands of nerves." The practice has settled down on the followers of our profession like a dark cloud, obscuring their vision and hiding the light which science would shed abroad.

Regeneration is needed and only to be obtained by right application of the principles of surgery, even though the operation take more time and skill than the slipshod method of application of arsenic, and it is in the hope that reformation may be had through the training of the student that this plea is made for greater emphasis on this point in college work. The practice of applying arsenic once formed will be difficult to overcome, as the busy practitioner, like the drowning man, will often grasp at anything in the hope that it will help him out. The fact is that the root of this evil lies in the management of the clientele. Too often dental practitioners have what they call consultation hours, into which they try to crowd all patients who need brief treatment, and for the time the office is converted into a cotton exchange. Perhaps a majority of the patients seen in these hours, if time had been reserved, might have been permanently aided by the operator, instead of having been put off with a treatment.

A lady recently showed me the root of a first bicuspid tooth broken off even with the gum, and gave the following history, which I believe to be the history of many teeth: "It was first filled with gold, but was so sensitive to cold that the filling was removed and arsenic applied. The tooth was then treated three times a week all during the winter till it broke off." If the operator (a graduate and a man of some reputation) had spent two hours on that tooth the pulp could have been removed, the root-canal filled, and the cavity ready for return of gold filling. It was not because the dentist did not know how that tooth could be saved, but because he had formed a villainous habit of applying arsenic and treating teeth.

What he should have done was to apply cocain cataphorically until exposure without pain was secured; next a piece of spunk saturated with cocain should have been placed over the exposed pulp, over this again a small piece of unvulcanized rubber, at first slight and gradually increasing pressure should have been used until the pulp became anesthetized; it could then have been removed, the canal wiped out with an antiseptic and filled. A temporary stopping should then have been placed in the cavity and an appointment made for permanent filling, or the temporary filling allowed to remain for a few months, at the option of the operator. If this practice were the rule we should see fewer instances where arsenical necrosis caused pericemental disturbances and ulterior loss of teeth.

Don't use arsenic. Don't dismiss your patients with cotton when you can help them by the application of your skill and knowledge. Excuses do not relieve pain. If your patient suffers do not stop short of relief. Bring to your practice the application of the Golden Rule: do unto others as you would that they should do unto you. This will make you a factor in the grand advance from ignorance and empiricism to the skilful application of scientific principles for the relief of suffering, an advance which will unquestionably mark the course of our noble calling. God speed the day.—*Summary.*

VALUE OF PURE SCIENCE TO THE DENTAL PROFESSION. By George A. Bates, D.D.S. Read before the Boston and Tufts Dental Alumni Association, June 16, 1903. In presenting this paper I wish to bring to your attention a few facts relative to some recent aspects of the embryology and histology of the tooth, together with some suggestions for future problems surrounding these important subjects which are awaiting investigation.

Origin of the Tooth. It will perhaps interest you to know that previous to the time, about fifteen years ago, that Röse gave to the world the true story of the development of the tooth, the origin of the first permanent molar was not known. It was stated by Legros and Magitot that the enamel organs of the permanent teeth were developed from the necks of the enamel organs of the deciduous teeth. This seemed to hold good for all the second dental equipment until the second deciduous molar was reached, which was said to produce the second bicuspid. The first permanent molar had no predecessor and so could not originate like the others from a

preceding deciduous tooth. It was therefore said to take its origin, like milk teeth, from the epithelial surface of the jaw. Dr. Röse, by the discovery of the tooth-band, settled this question and demonstrated that all the teeth, whether deciduous or permanent, originate from this fruitful source.

The development of the tooth is perhaps the most remarkable exhibition of modification for use which is presented anywhere in the body. Here are two sets of cells, one produced from epithelium and one from connective tissue, in close apposition, each concerned in the formation of a secondary substance of kindred nature and yet differing materially in chemical composition.

The principal factors in enamel development are the so-called ameloblastic cells. From these cells is shed out upon the already-formed dentin the material of which the enamel is to be composed. On one end of these elongated enamel-forming cells lies the formed enamel, and on the other the elements of the enamel organs, the intermediate layer, or *stratum intermedium,* and the stellate reticulum, which are supposed to furnish the material for elaboration into enamel to the ameloblasts. Between the *stratum intermedium* and the ameloblast Dr. Williams has demonstrated a fibrous membrane. Dr. Andrews demonstrated the existence of certain fibers which pass from the ameloblastic layer into this membrane. Dr. Williams has also shown that there are loops of arterial capillaries which through the *stratum intermedium* reach the ameloblasts, or at least the membrane which lies between these layers.

I wish to call attention to the fact that this arrangement is suggestive of glandular structure, also that this offers a suggestion of the possible nature and function of Dr. Williams' membrane, namely, that it acts in the capacity of lymph-spaces for conveying the lymph from the arterial capillaries, as well as the material held in store by the stellate reticulum and *stratum intermedium,* to the ameloblasts for the purpose of elaboration. There is no instance in the body where this function is carried on save by the connective tissue, and I wish to express my belief that this membrane is of connective-tissue origin at least, if not actually composed of connective tissue. I hope to demonstrate this one way or the other at some future time.

Enamel. Enamel is formed by tissue which is composed of specific cells modified from embryonic epithelium for the direct purpose of elaborating the material out of which the enamel is

developed. By no possibility can enamel be formed after this specific tissue ceases to exist, which it does when the tooth is erupted, therefore new enamel cannot be formed upon erupted teeth. Enamel has no tubuli like dentin and no communication with the blood supply, and therefore no power of regeneration. Phosphatic foods are thus ineffective in restoring defective enamel.

Caries. Imperfectly formed enamel is only a predisposing cause of caries. Teeth of marsupials have tubular enamel, and all the lower animals have less calcific material in the teeth than has man, and yet there is no caries. There is no specific form of microorganism yet discovered for dental caries. Any form which will split the molecule of sugar into alcohol and carbon dioxid will institute a condition of incipient caries by removing the calcium salts from the enamel and thus opening the way for the ingress of the organisms into the tooth structure. Sugar by forced oxidation is converted into certain forms which are transitional between sugar and CO_2. These are further reduced by bacterial action to form lactic acid. Many of these points are not new, but I venture to present them in this fragmentary way to refresh your memories and to suggest their very great importance to you as dentists.

Odontoblasts. I wish now to say a word concerning the other set of cells spoken of at the beginning—the odontoblastic. They are formed from the connective-tissue cells of the dentinal papilla. This papilla is eventually to become the dental pulp. In the adult dental pulp these cells form a membrane which covers the organ on its external surface, and a part of these cells sends processes through the dentinal tubules in the form of the dentinal fibrils. The cell also sends processes backward into the substance of the pulp. The odontoblastic cell is an example of the protean nature of the connective-tissue cell. This latter cell is the one which, whenever or wherever the need arises, may be transformed into almost any element of the body. For example, it may become a fat cell, it may be transformed into a bone-making cell or osteoblast, or into a plasma cell, or in certain pathological conditions into a cell so nearly resembling the epithelial cell as to be called an epithelioid cell. In the embryo it is made into blood and blood-vessels. It is closely related to the lymphatic system.

The odontoblastic cell is concerned in the developing tooth, with the formation of dentin, and in adult life it probably serves to keep

this structure in its integrity. The sensitiveness of dentin is in some way involved with it and its process, the dentinal fibril; just what is not known. This offers a problem for investigation which is eminently practical, for the discovery of the cause of sensitive dentin will indeed be a boon to the dentist.

Referring for a moment to the foregoing statement concerning the connective-tissue cell and its relation to the lymphatics, I wish to call attention to a statement made by one of the recent writers, "that there are no lymphatics in the tooth pulp." I think this statement grows out of a want of adequate knowledge of the lymphatic system. Lymphatic radicals are formed by the lining of connective-tissue lymph spaces by endothelial plates. The pulp is composed of connective tissue, and there are many such spaces in its substance. Wherever there are capillary arteries there must be extrusion of lymph into the surrounding connective tissue, and this extruded lymph can be disposed of only in one way, namely, by the lymphatic radicals which therefore must exist in the pulp. It is not necessary to have formed lymphatic vessels in a tissue in order to have lymphatics. Here is another field for investigation.

Value of Science to the Practical Dentist. After years of experience, both as a teacher in a dental school and as a practitioner, I am inclined to think that too little attention is given to the so-called theoretical side of dental education, and am also of the opinion that many practicing dentists do not quite appreciate the intimate relation which, in the growing knowledge that marks the times, has become established between the so-called practical and the scientific or theoretical aspects of a dentist's equipment. This is more or less inevitable, since the busy dentist is called upon to devote himself so constantly to the mechanical side of his profession. It is undoubtedly true that the estimate put upon the dental practitioner is in great part formed because of his skill as a mechanical operator. The truly wonderful results which have been and are being achieved in this field of effort are in themselves proof enough of the great importance of this side of dentistry. While this is true, it is equally true that the purely theoretical elements which enter into the training of the dental practitioner fill an immensely important place.

In these days when everything in the nature of material entering into the finished product of the dentist's work is furnished ready made to his hand; when carefully devised, accurately shaped and con-

structed instruments are at the operator's disposal, it is easy to become unmindful of the fact that somebody sometime has given much time and attention to matters of theory in order that the workman may have these things so necessary for the proper accomplishment of his work. It is easy to forget that the great fundamental sciences, such as anatomy, physiology, chemistry and the like underlie the whole subject of the adaptation of these materials to the requirements of practice. It is the self-sacrificing zeal of men who have devoted their lives and energy to the work which has rescued dentistry from the barber's shop, where it had its birth, and made the modern profession a possibility.

I am not unmindful of the fact that the study of the great scientific subjects above mentioned is to a great extent the work of the specialist, and that it is not essential for the practitioner to become a specialist in his knowledge of them. I am, however, confident that the field of dental practice might be materially widened if more attention were given to those parts of the great fundamental branches which pertain directly to the mouth and teeth. I believe the time is coming when the dentist will become the stomatologist; when every lesion liable to occur in the mouth will become the legitimate field of the doctor of dental practice. In the present state of dental education it is very exceptional to find a man in general practice possessed of the requisite ability to handle emergencies outside such as occur in and immediately about the teeth, which present themselves in every dentist's experience with more or less frequency. I am sure it is unnecessary to say that any condition which involves constitutional disturbances calls for a more or less profound knowledge in the fundamentals on the part of one who attends in the capacity of physician. Here a knowledge of pathology, materia medica and therapeutics is called for in a manner not at all necessary to the ordinary dental operation. It seems to me that the doctor of dental medicine should be able to meet all conditions, whether such as immediately concern the teeth or other parts of the oral cavity.

The need for more knowledge in fundamental sciences does not apply alone to such as may extend their practice to cases outside the direct treatment of the teeth. It is just as essential to the dentist who devotes himself to the so-called practical operations. How often one hears the statement that "it is a dentist's business to fill teeth," with the implied meaning that his responsibilities do and should end here.

I will venture to say that there are people practicing dentistry today who do not know and do not care to know the structure of a tooth; who never saw a microscopical section of a tooth, and who know the parts of the dental organs only by name. I think I ask a pertinent question when I say, "Is a man over-educated when he does know these things, and does he not represent his profession with greater dignity and usefulness with than without such knowledge?"

It may be in the end that there will come a tendency to establish a class of specialists in dentistry who shall be educated in the particular branches such as involve the necessity for a training in the foundation principles so necessary for an all-round dental education. This would leave the so-called practical side of the work to those whose tastes and capabilities seem to lead them naturally in that direction. Such a course would certainly broaden the field of dental practice and in some ways increase its usefulness. I have sometimes thought that the dental schools might profitably confer two degrees—the Doctor of Dental Medicine and the Bachelor of Dental Mechanics. This would give the two classes of students opportunity for more specific training in the two lines of education. There are people constantly presenting themselves for matriculation at the dental schools who display no taste nor capacity for purely scientific studies. They are good mechanics and many of them make fine operators. They will become good dentists in the ordinary meaning of the term and useful members of the profession. In the broadest sense, however, they can never become well-educated doctors of dental medicine. To give them the title is to misrepresent them and belittle the profession into which they seek admission.

Dentistry as a Specialty of Medicine. There has been much said and written concerning dentistry as a specialty in medicine. It has been compared to ophthalmology and other medical specialties. It must not be forgotten that all these branches of the great medical profession require a training in general medicine and a more or less extensive practice before they are possible as specialties. If dentistry is to claim a place as a branch of the profession of medicine, should it not enter as other departments do? It needs no word from me to demonstrate that such a course would call for extensive training in the collateral scientific branches of study, without which the doctor of medicine, as such, could have no existence.

If the profession of dentistry is to be considered solely from the

material or commercial standpoint, then the way to attain it should be by the shortest cut, so that it may begin as soon as possible to answer its legitimate requirements. But let it be called by its right name. Do not try to dignify a mere mechanical art by a professional title. On the other hand, if a dentist is to hold his place, as I most sincerely believe he should, in the rank of the learned professions, then the higher motive of service to humanity should stimulate him to the attainment of a broad, well-grounded culture. The purpose of his professional achievement should be the discovery of the underlying causes of those conditions, for the remedy and prevention of which he is called upon to exercise his knowledge and skill. When this attitude toward required education is assumed its claim to professional dignity becomes legitimate.

I am sure these sentiments find ready response in the minds of those who may be classed among the best and most responsible members of the profession. I have been impressed with the truth of this from the fact that many of my former students and others have been of late coming to me for instruction. The earnestness which they have shown in their attempts to acquire more extensive knowledge of fundamental things is to me the striking feature in this experience. It grows out of the need, observed by them, as they have looked out upon their field of labor. They have noted the woeful lack in these essential elements of training existing among members of the profession at large, and have felt the requirement in their own experience. The fact that such men are awakening to a realizing sense of these conditions is I think a hopeful sign of the times.

Great numbers of people are in these days attempting to crowd their way into the dental profession. The complaint is often heard that dentistry, like many other branches of industry, is becoming crowded. I am sure this is not true. Dentistry in the best sense of the term can never become crowded. There will always be a place for the well-educated man. The public is becoming more enlightened and consequently more discriminating. It is demanding more and higher attainments on the part of those who serve it in any capacity, and dentistry like all other departments of service must reach a high standard of excellence if it expects to hold its place. There always have been and always will be men who naturally gravitate to quackery. It is the half-educated man who is the quack.

The well-cultured man does not need to be such, even though his training did not make it impossible for him to stoop to it.

The whole field of dentistry is not covered now as formerly by its remedial resources. Prevention has become a most potent factor in the dentist's field of action. With the discoveries of Drs. Miller and Black the whole aspect of the subject of tooth decay has become changed. Caries is still the formidable foe of the teeth, but the mystery of its cause and action is much better known. New demands have come with increasing knowledge, preventive measures have taken their place in the front rank of the requirements of practice, and the doctor of dental medicine is called upon for a much wider wisdom than was formerly considered essential. Where the dental practitioner was once paid in great part only for his skill in restoring organs which had suffered wreck by the destructive action of disease, he is now in increasing measure required to equip himself with knowledge profound enough to furnish not only remedies but preventives as well.—*Items.*

NEURASTHENIC MANIFESTATIONS IN THE ORAL CAVITY. By Leo Greenbaum, M.D., D.D.S., Philadelphia. Read before the Northeastern Dental Association, Oct. 21, 1903. To speak in detail of the many causes which have operated to place the dental profession upon the high plane which it at present occupies practically is to recount its monumental achievements of the past fifty years. And gratifying as is the general concurrence of views that its practice has risen to a very high position, both in the ability to afford comfort and health as well as in its ennobling influences, we nevertheless must not rest content with past achievements but strive to further extend its usefulness.

My present purpose is not to speak of those matters with which you are fully familiar, but to invite you to a consideration of conditions which when more carefully studied in all likelihood will aid in giving dentistry a full justification for the higher reward to which it is deservedly entitled. I refer to those phenomena exhibiting themselves in one or several ways in the oral cavity and indicative of some systemic disturbance, *e. g.*: The destructive effects of lithemia may be observed in the mouth months before urinalysis might lead to its discovery. Changes in the mobility of the tongue may give the first indication of degenerative processes in the me-

dulla oblongata. The ascending infectious neuritis may have its origin in a defective tooth. Recent studies of the saliva appear to show that when its analysis yields certain substances expressive of abnormal chemical mutations we may therefrom suspect the existence of certain nutritional derangements which in time will assume the complete phase of a distinct morbid condition. When further researches shall have established the exact interdependence between the substances found in the oral fluids and the altered functions these reveal, and when this becomes common knowledge, together with its protective benefits, in the same sense as is today the ordinary practice of conserving the teeth, then it seems the practice of dentistry may be invested with the degree of vital reverence at present denied it.

Within the same category of thought, but more specific to the present purpose, allow me to draw your attention to a morbid condition that is rapidly assuming an alarming importance because of the pronounced increase in the number of cases noted, its puissant bearing on the future of our people, and most significantly because its oral manifestations give us an excellent opportunity for corroborative diagnosis of its early appearance. The morbid condition to which I invite your attention is, according to the most competent authorities, an outcome of the high pressure and great wear and tear of modern civilization, and it is variously designated "nervousness," "nervous exhaustion," "neurasthenia."

The Neurasthenic Patient. Many of you have had occasion to observe among your patients some who have become nervous—who easily get excited and upset. They may tell you that they can no longer work as they did; sleep is poor. They will tell you that they suffer from headaches; that the heart palpitates; memory is impaired; there is but poor appetite; food lies heavy on the stomach, the bowels are constipated, and so on. They are depressed and worried, often anxious and fearful if left alone. Many of these patients become cognizant of the fact that certain changes have taken place, and seek medical advice, and when this is properly given and followed they avert the sad results that overtake the majority, who being unmindful of the danger signals soon find themselves in the throes of an insidious disease.

Neurasthenia is defined as being a "more or less marked and persistent diminution of nerve energy, together with an increased re-

action, mental and physical, to external impressions; in other words, nerve weakness and nerve irritability. Careful studies of the changes caused by exercise in nerve cells of various animals have been recognized. They consist of a marked decrease in the size and a change from the smooth and rounded to a jagged irregular outline of the nucleus, and marked shrinkage in size of protoplasm. Recovery takes place in such cells when normal exercise is followed by rest of reasonable duration. It has been further observed that after prolonged stimulation nerve cells become completely exhausted and cannot again return to the normal state. These facts clearly point to the rational pathology of neurasthenia; nerve cells exhausted beyond the normal limit and without the proper opportunity for rest and repair." The condition is analogous in a way to the exhaustion of an electric battery in which the zinc plates have been consumed and the fluid charged with waste products.

In all tissue metamorphosis the result of exercise of normal function various waste substances are produced. These substances if excessive in amount act deleteriously upon the organism. In a sense they are poisonous. If present in normal amount they are under normal conditions properly elminated. When there is an excess of waste substances, however, there is a corresponding increase in their toxic action. The accumulation of these poisonous substances causes a true autointoxication and consequent interference with various functions.

Their first action is that of a gradual inhibition of function. Function becomes progressively more and more difficult. Secondly, perversions of function are next apt to ensue. We are doubtless in this way to account for the emotional depression observed in many cases and for actual qualitative changes in mental action. It is further extremely probable that in conditions of chronic and prolonged fatigue abnormal waste products are formed which may result in such serious mental disturbances as delirium, confusion, or stupor, with their attendant hallucinations, illusions, and delusions. Our interest in this lies in its oral disclosures. If we succeed in detecting an oral symptomatology expressive of the early appearance of nervous exhaustion, and if the discovery be made while rendering dental services, and the dangers indicated be properly presented to the patient, a factor will be established for a higher appreciation of our services.

Oral Manifestations of Neurasthenia.—"Among the earlier symptoms in conditions developing neurasthenia we find disturbances of the secretions of the mouth. The disturbances consist, first, in a diminution of secretion; second, in perversion of the secretion." It is a common thing for a patient to complain of dryness of the lips and throat. This dryness appears to be due to an actual diminution of the secretions of the mucous membrane and of the salivary glands. It is remarkable also that in spite of the dryness of the mouth and lips patients presenting these symptoms usually suffer from defective thirst. Further, when they do take liquids the dryness of the mouth is not relieved. The character of the secretions is modified. There is a distinctly unpleasant odor which differs from the odor caused by the mere retention of particles of food between the teeth. A peculiar offensive odor, sometimes indeed stercoraceous, attended by disorder or perversion of the secretions, is frequently met with in exhausted nervous states. Another marked symptom presented by patients suffering from nervous exhaustion is that of excessive tenderness of the gum, it being exquisitely sensitive to the touch of the finger and more or less sensitive to contact with food. Furthermore, the teeth may also share in this hyperesthesia. The hypersensitivity is not attended by any sign of gingivitis or other visible symptom.

My own experience with cases of neurasthenia has been too limited to permit of authoritative statements. However, a reference to the various medical authorities, especially the writings of Prof. F. X. Dercum of the Jefferson Medical College, fully justifies the statements made herein.

Disorders of the muscles of mastication—of the muscles of the mouth, and particularly of the lips, and tongue, are sometimes brought to the attention of the dentist long before the patient reaches a physician's care. Disorders of the muscles of mastication are, it is true, very rare, but nevertheless they are now and then seriously affected, *e. g.*, weakened or paralyzed, in such functional nervous disorders as hysteria. Weakness or anything approaching paralysis of the muscles of mastication would of course cause the case to be referred to a physician for examination. Again, marked tremor of the tongue, especially shrinking or apparent atrophy of that organ, would be facts of serious import. Similarly is it with impaired

mobility of the tongue. The following case fully illustrates this important point:

Case of Spinal Lesion.—Mr. S., past middle life. Loss of both upper and lower molars necessitated the construction of some mechanical device. As he objected to bridgework, we concluded to replace the lost teeth by introducing partial dentures on gold. These were adjusted in patient's mouth and apparently subserved their purpose very successfully. About six months later the patient returned claiming that he experienced difficulty in speaking, which he believed to be due to the presence of plates. Very close examination satisfied me that some other cause than any appertaining to artificial dentures was responsible for the deficiency manifesting itself, and in closely observing the patient I detected a peculiar irregularity in the action of the tongue when speaking, denoting a central nervous lesion. I removed the plates from the patient's mouth and requested him to return in one week. Upon his return he stated that the absence of artificial teeth was a serious inconvenience to him, emphasizing rather than diminishing his former difficulty of speech. This to me was confirmatory evidence of my original suspicion, and I resolved to communicate with his physician. In presenting my view of the patient's condition to the physician he ridiculed my contention of a central nervous disturbance, as no other manifestation of its presence could be detected, and warned me against disquieting the patient by imparting such a view to him, at the same time suggesting that I make better-fitting plates. One year later a marked case of spinal disease had developed, and the physician admitted his lack of judgment in not accepting the oral evidence so early developed, and which might have been of inestimable value if utilized at the time of its appearance.

Case of Epulitic Neoplasm.—The following case illustrates the great importance of close observation by the dentist in the detection of neoplasms: Mr. G., age about forty. In making an examination of the mouth I found a most marked enlargement upon the gum about one-half the size of an ordinary bean, situated near the cervical border of the upper left central incisor. The color of the tumor was identical with that of the gum tissue. There was no evidence of irritation or pain. Further examination revealed a very delicate but distinct line of demarkation between the growth and the gum tissue, indicating a deeper origin of the tumor. Upon questioning the

patient he positively insisted that the enlargement had always had its present appearance. I asked to be allowed to take an impression for future comparison. Eighteen months later the patient's physician consulted me with a view of making a comparison with the model, when we found a decided enlargement of the tumor. Its immediate removal was decided upon, and the operation and examination disclosed an epulitic neoplasm involving the periosteum of the outer plate of the alveolar process.—*Cosmos.*

A SCIENTIFIC INVESTIGATION TO DETERMINE THE VALUE OF GUTTA-PERCHA AND CEMENTS TO PREVENT THE PASSAGE OF INFECTIOUS MATERIAL. By George W. Cook, B.S., D.D.S., Chicago. Ever since the investigation of spontaneous generation was begun in a scientific way by such men as Tyndall and Pasteur various means of determining the best methods of sterilization, and the retention of substances from becoming contaminated with the bacteria of the air and such other infectious materials as would enter into and infect certain neutral sterilized material, have been experimented with. Various mechanical means have been tried with the hope of obtaining a perfect mechanical barrier for the prevention of the passage of bacteria. It has been found in the cultivation of microorganisms that cotton is one of the surest and most efficient means for their stoppage, especially where it is free from moisture, but as is well known, cotton has its limitations and cannot be adopted except in bacteriological laboratory work.

Since it has become a well-recognized fact that dental caries is a micro-biological process, various means and materials have been tried, some have been adopted, others have been discarded, according to their inefficiency or appropriateness for the excluding or preventing the entrance of bacteria and their action upon the hard or soft tissues, as the case may be. Through a more or less crude or empirical practice certain means and materials have become almost universally adopted as barriers to the entrance of bacteria into tooth structure, and into the cells and tissues where the physiological activities are more active and the liability of establishing pathological activities greater, thus rendering certain organs incapable of carrying on the functional activities of the part in a normal way.

Some of the materials that have come into almost universal use for the prevention of infectious material entering tooth structure and causing the well-recognized phenomena of disease are gutta-percha and the cements. My purpose in this paper will be to give you the results and some conclusions of a series of experiments carried out to determine the value of these two agents in fulfilling the mission that they are so universally used for. In 1896 and 1897 I made a few experiments, and at that time came to the conclusion that the reliability of the manipulation and mechanical adaptation to such material as glass or porcelain was of such uncertain character as to render the work valueless and not worthy of publication, consequently the subject was dropped until something less than a year ago, when A. E. Webster of Toronto, Canada, announced to the profession that these materials had practically no value as barriers to bacteria. I again took up the work in a more thorough and systematic manner, adopting some of the methods used by Dr. Webster and devising some means of my own.

The first series was by taking the ordinary test tubes and placing in each about 10 c.c. of beef bouillon, stopping the tube in the ordinary way with cotton, and sterilizing three successive days so as to render the tubes free from infectious material. Each tube was then taken between the thumb and forefinger of each hand, and in a slanting position was revolved in a blowpipe flame until the tube had been softened so that it could be drawn out to a fine capillary constriction about midway between the bottom of the tube and the mouth. Then with all instruments well sterilized by heat, the mouth being thoroughly sterilized, this capillary constriction was filled by pumping first chloro-percha, allowing it to evaporate to a very thick consistency; then with a warm gutta-percha plug it was forced into the constriction with as much pressure as the constricted portion of the tube could bear. The cotton stopper was replaced and the tube set aside for about an hour, when the chloro-percha had had ample time to become almost solidified, and another treatment was given this tube by placing more chloro-percha and another pellet of warm gutta-percha, and the tube was set aside until the chloro-percha had again become solidified. The cotton stopper was removed from the tube and 5 c.c. of infected bouillon placed in the upper portion. The tube was then laid in a slanting position in the incubator, so that the infected bouillon was in touch

with the upper portion of the gutta-percha filling, and the lower portion of the filling came in contact with the sterile bouillon.

In this first series of twenty, treated in this manner with the greatest possible antiseptic precaution, during the first twenty-four hours there was no infection; forty-eight hours no infection; seventy-two hours no infection; the third day no infection; the fourth day one tube showed signs of infection. A cultural and microscopic examination showed that this tube was infected with the microorganisms that the bouillon in the upper portion contained; but the germ had taken on some morphological changes, and when transferred to fresh bouillon did not grow in the luxurious way that the culture from the control showed. On the sixth day there appeared a growth in another tube; on the tenth day the third tube had a growth. By the fifteenth day the culture medium containing the infection in the upper portion of the tube was considerably evaporated, and 5 c.c. of sterile bouillon were added to the remaining tubes that had not become infected in the lower portion. On the fifth day after the addition of fresh bouillon two more tubes became infected, and on the tenth day after one more tube became infected. The remaining thirteen of this series stood thirty-eight days, with occasional additions of sterile bouillon to the upper portion of the tube, when another tube became infected. After an observation of fifty-one days the remaining tubes were found to be sterile in the lower portion.

The second series was prepared in a similar manner to the first, as regards the sterilization of the bouillon and the drawing out of the tubes. Five were filled with a certain kind of cement, some being mixed in a way that is usually followed out in practice, with the exceptions that the glass slab and the spatula were thoroughly sterilized. The constriction in the tubes was filled in the usual manner by pumping cement into the capillary portion, and then with a pellet that had been mixed to a thicker consistency, and with all the force that the tube could bear, the cement was forced into place. These were allowed to dry for about two hours, and 5 c.c. of infected bouillon were placed in the upper part of the tube, as described in series No. 1. On the following day two of these tubes were found to be broken, which was afterwards found to be due to the expansion of the cement. The other three tubes of this same cement prevented infection for twenty-two days, when it was

found that the cement had to some extent undergone disintegration. Of course it must be understood that fresh bouillon had to be added to these cultures from time to time, for the microorganisms will use up a great deal more than 5 c.c. of bouillon in twenty days, especially if their vegetative physiological activity is kept up to its highest possibility. In another five tubes of this series filled with a certain make of cement, on the third day one tube was found to be infected, but not with the microorganism that the bouillon was infected with in the upper portion of the tube, which showed that an accidental infection had been produced. The other four tubes of this lot stood for ten days, when one became infected with a germ in the upper portion. On the fourteenth day all the tubes except one had become infected.

It might be well to state here that after the infection had taken place in the lower portion of these tubes a rapid disintegration of this particular kind of cement took place. In the next lot of five of series No. 2, filled with another make of cement, two became infected on the third day; the other three remained sterile for twenty-seven days, when another became infected. The other two remained sterile for fifty-seven days. In the fourth lot of series No. 2, filled with another make of cement, one became infected on the fourth day, while the other four remained sterile for forty-three days, when the second tube became infected. On the forty-ninth day the third tube was accidentally broken. The other two tubes remained sterile until the sixty-first day, when both were found to be infected.

In series No. 3 twenty-two were drawn in the same way after having been filled with sterile bouillon as described in series No. 1. The constrictions in ten tubes were filled with chloro-percha pumped in in the usual way and a cone-shaped gutta-percha point which was forced in the constriction with all the pressure that the capillary tubes would allow. The tubes were allowed to dry thoroughly for about two hours. When the chloro-percha was found to be pretty thoroughly evaporated a good-sized filling of a certain kind of ement was mixed to various consistencies and placed over the gutta-percha filling, and a moistened pledget of cotton was placed in contact with the cement. After it had become fairly hard infected bouillon was placed in these tubes in the manner above described. One tube was found to be infected on the fourth day,

while the other nine tubes remained sterile for fifty-eight days, when by taking a sharp instrument a groove was found to be forming between the cement and the walls of the tube, which showed that the cement was undergoing a progressive disintegration. Of the other ten tubes of series No. 3 five were filled with oxyphosphate of copper and treated in the manner above described. The infected bouillon showed very little signs of growth, and on a microscopic examination of the bacteria in the upper portion of the tube it was found to have undergone morphological changes, until it was suspected that a mixed infection was present, which necessitated transferring some cultures to a sterile nutrient media, where they resumed the original type and proved to be the same organisms with which the bouillon had at first been inoculated. The lower portion of these tubes did not become infected for over sixty-five days. The other five tubes in series No. 3 were filled in the constricted portion with oxychlorid; one was found to be infected on the fourth day; on the seventeenth day the second, on the nineteenth day the third, and on the thirty-first day all the tubes were infected. The fourth tube was infected on the twenty-seventh day, and the fifth on the forty-ninth day.

In series No. 4 the experiments were carried out in the following manner: In small test tubes, the capacity of which was about 15 c.c., was placed bouillon which was approximately 5 c.c., and stopped in the usual manner with cotton and sterilized three successive days. In much larger test tubes were placed about 20 c.c. of bouillon, sterilized in the usual manner. The mixing slab for the cement and the spatula were thoroughly sterilized by heat, and the mouths of the small tubes were carefully sealed under aseptic precautions with various mixes of cement. These small tubes were then placed in the large tubes containing the 20 c.c. of sterile bouillon, and they were placed in the incubator. The first ten tubes were stopped with a particular kind of cement and allowed to set before placing in the large tubes. Two out of the ten were found to be infected on the second day; one on the third day; seven on the eighth day. Three tubes were found to remain sterile, when one of these had become infected; two remained sterile for sixty days. The other ten tubes in series No. 4 were stopped in the manner above described with another make of cement, and placed in the large tubes after the cement had thoroughly set. It was found on

the third day that three of these tubes were infected, and by the eighth day all were infected.

Being somewhat astonished at the remarkable differences in these two cements, I had a long conversation with a cement maker, who gave me some valuable information in regard to the mixing and setting of cements. I then took ten more tubes and stopped the mouths in the manner above described, and with moistened cotton wrapped around the cement until it had thoroughly set; they were then placed in the inoculated bouillon. On the third day one tube was infected, and on examination it was found that there was a defective place between the edge of the tube and the cement stopping. The other nine tubes are still in the infected bouillon. After twenty-seven days ten tubes were stopped in the manner above described with gutta-percha. After heating the gutta-percha, and the mouth of the tube being passed through the blaze several times, the gutta-percha cap was placed over the mouth of the tube and a heavy coating of chloro-percha wrapped over the entire cap and around the neck of the tube. These were placed in the large test tubes in the manner above described. On the third day one of these tubes was found to be infected, and on the fifth day a second. The other eight tubes have remained in the infected bouillon for twenty-seven days and are still sterile.

Experiments in series No. 5 were to determine if possible whether moisture or infectious material would pass through thin gutta-percha bags. Some small bags were made of gutta-percha, and from 2 to 4 c.c. of infected bouillon were placed in them and thoroughly sealed up. They were then dropped in test tubes containing sterile bouillon and allowed to remain eight days. One out of ten became infected. The bags were then taken out of the sterile bouillon, opened, and cultural and miscroscopic examinations were made, to find that all of these contained the same microorganisms that had previously been placed therein.

One interesting fact observed in the use of chloro-percha in connection with the pure gutta-percha is, that it should be allowed to set entirely free from moisture. After the first application has thoroughly set an additional application of the chloro-percha should be made in the way above described, by adding chloro-percha, and then with a warm piece of gutta-percha packed thoroughly so that the space that has drawn away from the walls can be refilled. I

need not say here it is a well-observed fact that chloro-percha contracts during the process of evaporation. The pure gutta-percha contracts very slightly when heated and placed in contact with a glass tube that is at room temperature, but if the tube was kept at the incubating temperature I could not detect any contraction. This was determined by using certain analin dyes.

In series No. 6 I used oil of eucalyptus before placing the chloro-percha and the gutta-percha plug as above described. It was found that by the tenth day the sterile bouillon in the lower portion of the tube had become infected. It might not be out of place to say here that gutta-percha dissolved in eucalyptus will undergo a much greater contraction than when used with chloroform. A series of ten tubes was treated by dissolving gum sandarac with alcohol, and then varnishing the constricted portion with this agent; then with the chloro-percha a small quantity was placed in the constricted part, and the gutta-percha plug was forced in as above described. These tubes prevented the passage of bacteria for a great deal longer time than did those treated with eucalyptus. In another series of experiments I tried the process of etching the glass or roughening the surface, and found that the chloro-percha did not contract nor draw away from the glass as it did from the smooth surface. I am of the opinion, however, that a perfect mechanical stopping to the passage of bacteria is possible with chloro-percha in connection with gutta-percha, but that, I think, is very seldom accomplished. As for the cements, I think it depends almost solely upon the mixture, the presence of moisture, etc.

Under the title of "Disintegration of Cement Fillings" is a paper by J. E. Hinkins of Chicago and S. F. Acree. There will be found some very interesting facts as regards the chemical action of both acids and alkalies on the chemical disintegration of cements. There is one fact to be borne in mind in this connection—that many forms of bacteria are capable of disintegrating almost any substance when they are in constant contact with it and are well supplied with nutrient media. This is called a catalytic action or action by contact. Hinkins and Acree called attention to the fact that bacteria and their products have a considerable chemical effect on cements. There is no question but that the dissolving away of cements in the oral cavity is accomplished almost entirely by certain forms of microorganisms and their products, and that such process would

of necessity take place more rapidly in test tubes than it would in the mouth.

I have here in as brief a manner as possible given you the results of these experiences. There are a great many interesting observations with this kind of work that have not been worked out in detail. One is the expansion and contraction of cements, and under what circumstances such changes are brought about. I found that by mixing a certain kind of cement to a certain consistency it would expand within a few hours to the extent that thin glass capillary tubes would be broken, and the same cement mixed in the same manner would contract in ten to fifteen days so that with a little jarring it would easily slip out of the tube. It must be taken into consideration that the making of a cement for the purpose of filling teeth is purely a chemical process, the chemical combining of these two agents is accomplished by definite and fixed laws, and the slightest variation to the one-hundredth of a degree of this law necessarily changes the chemical constituents of this substance. That is what must be considered in connection with bacteria passing through or along the side of this agent. Another very important point in this connection is the kind of organism that is used in the experiment, and also the kind of media. Bacteria produce a definite and fixed chemical agent when all of the physiological environments are present for their growth, but it is a well-known fact that unless the nutritive substances are present they will not conform to all of the biological principles of producing these chemical substances that have more or less influence on both organic and inorganic material. —*American.*

CULTIVATION OF THE POSITIVE. By Wm. W. Belcher, D.D.S., Rochester, N. Y. This story of the cultivation of the positive is in large degree of a personal nature. I beg you to overlook the many personal pronouns, also the fact that this is an ideal. The practice of the positive is not carried personally to the degree that might be inferred from some things herein presented, but as I hope and am striving to make a reality.

The more one learns the more he doubts. Ignorance and the positive are closely associated. As we grow older and wiser new doubts present themselves to disturb supposedly long settled questions. The atmosphere was regarded by the ancient philosophers

as an element. Modern science had shown it to be essentially a mixture of oxygen and nitrogen with a small amount of carbon dioxid, ammonia, etc. Had anyone questioned the positiveness of our knowledge of its constituents he would have been ridiculed. Nevertheless a new observer has demonstrated that it contains a substance which he calls Aragon, and the end is not yet. Indications point to another constituent which has not been determined. Thus we learn that things which are *absolute* or *positive* are few and far between; perhaps the only absolute science is mathematics.

But to the laity dentistry is a positive science, and the man who does not at once express a positive opinion on a subject that requires the combined wisdom of Solomon and the serpent is considered a person with no great confidence in himself, therefore to be avoided.

Positiveness does not necessarily imply crankiness or ugliness; these come to us all only too early—one of the penalties perhaps of growing old. To be positive it is not necessary to be a "Sir Anthony Absolute," nor to brag of one's attainments. A man may be quick, silent and full of decision, and yet be a gentleman. "All the world loves a lover," but also let it be said it loves a positive character, even though it may not agree with him. We do not all admire President Roosevelt, but his genuineness and his earnestness are irresistible. The Bible, a book of positive teachings, and Shakespeare, a creator of positive characters, are our greatest books. In fiction the sentimental Tommies inevitably give place to the man who can carry "A message to Garcia." The public likes men who *do* things; it delights in results.

It is only within the past few years that I have recognized the lack of positiveness in my relation with patients, and have tried to correct it. We must recognize that even overconscientiousness may be an evil. A fault promptly acknowledged is often the means of winning another's confidence. On rare occasions a patient comes to me and says, "Doctor, one of the fillings you inserted has come out." I examine my register and find the patient is correct in his statement; I say, "Yes, that was one of my superior fillings." "What made it come out?" asks the patient. "I don't know, but I suspect it wasn't put in properly. I am sure I intended it to be perfect, but the Pope and the Church of England are the only infallible institutions of my acquaintance." I am sure the patient respects me more and has fully as great an opinion of my ability as

though I had lied to him and claimed to be the one and only dentist who couldn't make a failure.

On the other hand, I believe we cannot under any circumstances allow the patient to dictate as to the material or method to be employed. Do not let the patient or his friends induce you to act contrary to your best judgment. "Be sure you're right, then go ahead." "I had a new experience to-day," relates a brother practitioner. "About a year ago the mother of a young Miss, whose teeth I had several times refilled with cement, preparatory to the time when they would be in proper condition for gold, called at my office and said, 'Doctor, in regard to my daughter's teeth; you have been filling them with cement; Dr. Blank says they should be filled with gold; what do you think?' 'I think they should be filled with cement.' 'But isn't Dr. Blank a good dentist?' 'One of the best in the city.' 'But he says they should be filled with gold!' 'Notwithstanding Dr. Blank's opinion, I still maintain that the teeth are, for the present, better filled with cement.' The mother took her daughter to Dr. Blank; to-day the lady returned, but strange to say I did not know her; in fact, she found it necessary to introduce herself. She desires to put her daughter in my care again, to do as I please in regard to her teeth. The rest of her family have continued with me. Now, to my old patients I charge the old fee; new patients, new fee. This lady and her daughter come under the new rule and henceforth pay accordingly." It is my humble opinion that this gentleman knows how to conduct a dental practice.

Be careful and examine thoroughly before expressing an opinion; once given, do not lightly change it. Avoid, if possible, explanations; you may desire to change your procedure; this involves a new explanation and loss of confidence on the part of the patient. This is especially applicable in regulating operations. "To what fact do you most attribute Dr. Blank's success?" I asked of a gentleman who had been closely associated with him. "Largely in the convincing way in which he says $15.00; it leaves the patient no chance for argument." Reader, there *is* something in *this*. Once having set a fee for services rendered, stick to it.

The story is told by one of the partners of a successful hardware firm in Philadelphia, that when they first started in business an early patron was Stephen Girard, who desired to purchase a keg of nails. A price was quoted to him by the senior partner; he

protested they were not worth it and asked for a lower figure, but on meeting with a firm refusal purchased the nails. Several weeks elapsed before he again made his appearance, when he was approached by one of the partners, who said to him, "Mr. Girard, my partner and I, after considering the matter, have concluded that, although the price quoted to you on that keg of nails was as low as we could possibly afford to sell them, we realize your patronage would be a great help, and we might have sold the nails to you at a slightly reduced figure, even if we lost on them." "My dear sir," was the reply, "I want you to make a fair, living profit; but if you had lowered on your first price I would have thought you were trying to cheat me, and never come into your store again."

When you have occasion to make a request of the patient, make it the "Queen's request." If you find it necessary to issue a prescription, ascertain on the next visit of the patient if he has followed it; if not, why not? Inform him that you do not want the case if you cannot have his hearty cooperation. If you find the use of some agent indicated, do not say it is a good thing to use; *order* its use. Impress him with the fact that his teeth are going straight to hell if he does not follow your advice.

When making an appointment, always give the patient a card with the day and hour; if she makes her appearance at four o'clock when her card reads three o'clock sharp, do not wait on her, even if you have abundance of leisure, and four o'clock is a better time than the one appointed. Give her a new card, with the information that three o'clock means just what it says, and the next broken appointment, without reasonable notice, means a charge for time lost. Of course, if the car broke down or the baby had convulsions, accept it as an excuse—it *may* be true; but make a new appointmnet.

In the treatment of children make it a point first to be truthful; never an untruth under any circumstances. A great point is to have the patients, especially the small ones, rid themselves of the idea that they are about to be killed. How many times do we see patients holding themselves under a strain, expecting every moment to be called upon to endure excruciating pain? After the patient and I are somewhat acquainted I say to him, "Now, I'm not going to hurt you for the present; before I begin to hurt I'll let you know and you can get ready." I then proceed with the preparation of the cavity; perhaps a chisel is used to break down the enamel—much

noise but little pain. If I see the patient is still under a strain and acts as though every minute is to be his last, I stop and say, "Did that hurt you? No! I thought not." It puts him more at his ease. If the patient is a child I say, "Did I ever tell you an untruth? Now, I mean just what I say; it is *not* going to hurt. If you don't believe this I shall think you have no confidence in me." "But Doctor, it makes such a noise!" "Yes, so it does, but did you ever hear the story of the old farmer who wouldn't buy a lightning rod? He wasn't afraid of the lightning, but if the agent had any *thunder* rods he would take half a dozen!"

You cannot treat all patients alike. The man who does this is doomed to failure. On rare occasions I have gone to the extreme of threatening to send a patient home. One recent experience I remember—a lady who would *not* believe—who *would* persist in making a movement toward the ceiling and grabbing my hand at every opportunity. I told her that she must consider me a falsifier of the first degree. If she knew of anyone in whom she had more confidence, for pity's sake employ him; but it would be necessary to conduct herself with a fair amount of decorum or I would not attempt to do anything more for her. The lady quieted down and proved a model patient. When I had finished she asked, "Do you have to scold many of your patients?" "Not many, but I notice it does the select few a world of good." "Well, I know it did me; it was just what I needed."

When the time comes that I must inflict considerable pain, I tell the patient to make himself ready, and I find even the child will bear with comparative willingness a considerable pain if he is assured it is to be soon over and no more than he can endure.

In conclusion, I believe every man can make his practice whatever he pleases. If he shows a lack of decision—trouble and vexation without end. If he be kind, sympathetic and positive—a pleasure. It lies with him to make it his own heaven or his own hell.—*Dent. Off. and Lab.*

To Replace Broken Plaster Tooth on Model.—J. R. Herzog, in *Summary*. When a plaster tooth or crown is broken from a model the best way to replace it is to drill a hole about one-eighth of an inch in both the model and the broken tooth, forming a pin of cement, after you have placed cement on both parts and correctly placed them. The cement used for this purpose should be mixed very thin.

The Dental Digest.

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Where All Communications Should be Addressed.

Editorial.

A SWEEPING VICTORY FOR THE PROTECTIVE ASSOCIATION IN THE SUPREME COURT OF THE UNITED STATES.

In order that our readers may better understand the subject-matter of this editorial, we will give a little history of the conditions and contentions growing out of the rulings of one of the Federal judges in New York on suits brought by the International Tooth Crown Co. against members of the Association. This judge decided and so ordered that he had the power to compel the attendance of several members of the Association before a court official, making them submit to an examination day after day of all the work done by them in the mouths of their patients, their books describing the same, and giving the names and addresses of each individual patient. The Association's attorney instructed the members to refuse to answer questions or attend on such examinations, and for so advising an attempt was made by the lawyer for the International Tooth Crown Co. to have our attorney fined $5,000 and sent to the Ludlow St. jail, but the Court refused to do this. It did, however, compel those members of the Association to submit themselves for examination and to answer said questions under penalty of jail imprisonment and a heavy fine, and the members attended over a period of several weeks before a court official, disclosing the names of their patients and the detail of the work in the latter's mouths. This testimony was taken prior to the final trial before a Master in Chancery with a view to ascertaining how much crown and bridge-work these dentists had done, the nature of the work, etc., and thus determining for how much they were liable to the Crown Company.

One of these cases was afterwards tried before a jury under the instruction of a judge, and a partial finding was made against our client. This case was then taken by the Association to the U. S. Circuit Court of Appeals for the Second Circuit, and by it sent to the Supreme Court of the United States, upon the question as to whether or not any Federal judge had the power to so compel an examination of any dentist in this manner. The Supreme Court of the United States has just handed down a decision, reversing the trial judge and deciding that in no patent case in an action at law can any dentist in this country be compelled, antecendent to the trial, to appear before any court official and be subjected to any questioning whatever regarding his practice or his patients. This decision of the Supreme Court is now the law in every state and territory of the United States, and never again in any case in the future can any such harassment and baiting be put upon any member of the Association as these men were subjected to in the recent New York litigations.

In order to get a better comprehension of the importance of this decision, let us imagine that the Supreme Court of the United States had decided the question the other way, and ruled that in any place in the United States patent claimants, or in cases of damage suits any court official or Master in Chancery, could compel dentists who were sued to present themselves every day for weeks at a time, and submit themselves, their books and their patients to examination before such official, without the protection of the court. They might be subjected to all forms of ill treatment, and in many cases would have to travel long distances, and the prosecutors by leniency of the Master might adjourn the sessions from day to day on any pretence, thus increasing the hardship of loss of time and expense. It then is easy to see the fallacy of the proposition laid down by the judge in his statement, namely: *"The practice of examining before trial under the New York practice is a most wholesome one; it tends to simplification of the trial and frequently leads to settlement out of court."*

The last statement is probably correct, and in the sense that the case is simplified by settlement without trial, probably correct also; but the reasons for these two results under the New York code lie far outside of any element of justice or equity and the rights of the person or property involved in any litigation. The type and char-

acter of the litigation represented by the case just decided clearly illustrate the truth of the clause of contention asserted in the quotation of the Court's reason why such practice often leads to final settlement out of the court. It was only the extreme loyalty of the members sued who came under this ruling that we succeeded in preventing settlements out of court by all these defendants, it being much easier and cheaper for them to pay the claims of the Crown Co. They would thus have avoided the loss of time and the divulging of the names and addresses of their patients, which latter disclosed not only to those interested in the litigation, but to whomever through curiosity or malice would examine the records, the infirmities of the mouths and teeth of their patients, and made permanent court exhibit of the same, with all the attendant results that envy or gossip might circulate regarding such matter. When the judgment of the claimants would be proportionately small compared with all these harassments, is it any wonder under such ruling that settlement would be forced in many cases out of court? We wish here to compliment the members who did act thus loyally and allow this question to be finally settled as it has been in the Supreme Court of the United States, and thus aid us in annulling a practice which was harsh, vicious and indefensible.

We have been quiet about this litigation and this point, but will now frankly confess that if we had not succeeded in defeating this ruling the Protective Association would have been powerless to have aided its members in assaults made upon them under this practice. As the matter stands, however, every dentist in the United States has great cause for congratulation.

Notices.

CANADIAN DENTAL ASSOCIATION.

The annual meeting of the Canadian Dental Association will be held at Toronto, Ont., Sept. 6-8, 1904.

W. CECIL TROTTER, Secy., Toronto.

LAKE ERIE DENTAL ASSOCIATION.

The Lake Erie Dental Association met at Cambridge Springs, N. Y., May 17-19, 1904, and elected the following officers: President, J. M. Crosby, Bradford; Vice-president, G. F. Bowman; Secretary, V. H. McAlpin, Warren; Treasurer, J. H. Heivly, Oil City.

FRANKLIN DENTAL SOCIETY.

The Franklin, Pa., Dental Society was organized May 9, 1904, and the following officers were elected: President, C. D. Elliott; Vice-president, Louis Richards; Secretary, George W. Boyd; Treasurer, A. Kolb.

WISCONSIN STATE DENTAL SOCIETY.

The thirty-fourth annual meeting of the Wisconsin State Dental Society will be held in Manitowoc, July 19-21, 1904. A cordial invitation is extended to all ethical practitioners to meet with us.

W. H. MUELLER, Secy., Madison.

OHIO VALLEY DENTAL ASSOCIATION.

The Ohio Valley Dental Association met at Steubenville, O., May 17, 1904. and elected the following officers: President, E. C. Parr, Martins Ferry; Vice-president, D. D. Wallace, Scio; Secretary, W. Shannon, Steubenville; Treasurer, W. R. Allison, Steubenville.

DETROIT DENTAL SOCIETY.

The Detroit, Mich., Dental Society held its annual meeting May 12, 1904, and elected the following officers: President, C. P. Wood; Vice-president, W. A. Griffin; Secretary, Fred McDonald; Treasurer, G. C. Bowles; Member Board of Censors, G. D. Watkins.

ROCHESTER DENTAL SOCIETY.

The Rochester, N. Y., Dental Society held its annual meeting, May 17, 1904, and elected the following officers: President, F. W. Proseus; Vice-president, L. C. Johns; Secretary, George C. Lowe; Treasurer, W. A. Windell; Librarian, B. S. Hert; Member Board of Censors, Frank French.

HARRIS DENTAL ASSOCIATION.

The annual meeting of the Harris Dental Association was held May 4, 1904, at Pequea, Pa., and the following officers were elected: President, H. K. Baer; Vice-president, L. W. Pownall; Secretary, P. R. Byerly; Treasurer, W. H. Trout.

CONNECTICUT STATE DENTAL ASSOCIATION.

The annual meeting of the Connecticut State Dental Association was held at Hartford, April 20, 1904, and the following officers were elected: President, D. W. Johnston, New Haven; Vice-president, E. B. Griffith, Bridgeport, Secretary, F. Hindsley, Bridgeport; Assistant Secretary, C. C. Prentiss, Hartford; Treasurer, W. O. Beecher, Waterbury; Executive Committee, E. S. Gaylord, New Haven; E. S. Rosenbluth, Bridgeport; H. A. Spang, New Haven; Librarian, R. H. Keeler, New London; Editor, A. H. Spicer, Paucatuck.

JACKSON DENTAL ASSOCIATION.

The annual meeting of the Jackson, Mich., Dental Association was held April 13, 1904, and the following officers were elected: President, W. H. Morse; Vice-president, F. E. Robinson; Secretary and Treasurer, George Baylis.

SUPREME CHAPTER, DELTA SIGMA DELTA.

The twentieth annual meeting of the Supreme Chapter, Delta Sigma Delta Fraternity, will be held Aug. 31, 1904, at St. Louis. George Edwin Hunt, 131 E. Ohio St., Indianapolis, is chairman of the Committee on Arrangements.

CENTRAL DISTRICT DENTAL SOCIETY.

The Central District Dental Society held its annual meeting at Worcester, Mass., April 18, 1904, and elected the following officers: Secretary, H. P. Cooke; Treasurer, W. H. Gilman; Councillor, G. E. Savage; Executive Committee, R. A. Bush, A. F. Wheeler, R. R. Stinson.

EASTERN INDIANA DENTAL ASSOCIATION.

The Eastern Indiana Dental Association met at Richmond, May 4, 1904, and elected the following officers: President, B. S. Binford, Greenfield; Vice-president, R. I. Bell, Greenfield; Secretary and Treasurer, G. E. Stevenson, Liberty. The next meeting will be held at Greenfield.

OKLAHOMA DENTAL ASSOCIATION.

The Oklahoma Dental Association held its annual meeting at Shawnee, May 12, 1904, and elected the following officers: President, R. A. Pendleton, Norman; Vice-president, T. Bringhurst, Shawnee; Secretary, C. L. White, Guthrie. The next meeting will be held at Oklahoma City.

MASSACHUSETTS BOARD OF REGISTRATION IN DENTISTRY.

The next meeting of the Massachusetts Board of Registration in Dentistry for the examination of applicants will be held in Boston, June 22-24, 1904. Application blanks and all necessary information furnished by the Secretary.

G. E. MITCHELL, Secy., Haverhill.

SUSQUEHANNA DENTAL ASSOCIATION.

The Susquehanna Dental Association met at Harvey's Lake, Pa., May 21, 1904, and elected the following officers: President, George Luxemberger, Scranton; Vice-president, O. H. Uhler, Allentown; Secretary, T. W. Thomas, Wilkesbarre; Treasurer, J. C. Hertz, Easton; Financial Secretary, G. C. Knox, Scranton; Executive Committee, H. M. Beck, Wilkesbarre, B. M. Carey, Wilkesbarre, E. T. Donnegan, Scranton, W. H. Fordham, Scranton.

COLORADO COLLEGE OF DENTAL SURGERY ALUMNI ASSOCIATION.

The Alumni Association of the Colorado College of Dental Surgery met May 14, 1904, and elected the following officers: President, Harry W. Bates; First Vice-president, N. J. Grosjean; Second Vice-president, J. C. King; Secretary and Treasurer, F. G. Hunt.

NORTHERN IOWA DENTAL SOCIETY.

The annual meeting of the Northern Iowa Dental Society will be held at Waterloo, July 26-28, 1904. A pleasing and profitable program is being prepared, and brother dentists from neighboring states are cordially invited to be present.

C. L. TOPLIFF, Secy., Decorah.

CHAMPAIGN COUNTY DENTAL SOCIETY.

The Champaign County, Ill., Dental Society was organized April 18, 1904, and the following officers were elected: President, F. O. Sale, Urbana; Vice-president, H. E. Davis, St. Joe; Secretary, J. Addison Brown, Champaign; Treasurer, W. H. Boon, Champaign.

J. ADDISON BROWN, Secretary.

GEORGIA STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the Georgia State Dental Society will be held in Athens, June 28-30, 1904. Arrangements are being put forth to make this the greatest convention ever held in Georgia, and all ethical practitioners are cordially invited to be present.

D. H. MCNEILL, Secy., Athens.

NEBRASKA STATE DENTAL SOCIETY.

The Nebraska State Dental Society held its annual meeting at Omaha, May 19, 1904, and elected the following officers: President, W. R. Smith, Pawnee City; Vice-president, F. R. Ross, Omaha; Corresponding Secretary, H. R. Hatfield, York; Recording Secretary, M. E. Vance, Lincoln; Treasurer, H. T. King, Fremont; Board of Censors, F. D. Sherwin, Lincoln; W. H. Sherradan, Omaha; W. M. Dorward, Omaha. The next meeting will be held in Lincoln.

MISSISSIPPI STATE DENTAL ASSOCIATION.

The Mississippi State Dental Association held its annual meeting at Jackson, April 21, 1904, and elected the following officers: President, L. G. Nisbet, Aberdeen; First Vice-president, W. H. Reaben, Macomb City; Second Vice-president, J. E. Frazier, Canton; Recording Secretary, E. M. Bingham, Pontotoc; Corresponding Secretary, L. G. McLaurin, Fayette; Treasurer, C. C. Crowder, Kosciusko. The next meeting will be held at Jackson.

LAWRENCE DENTAL CLUB.

The Lawrence, Mass., Dental Club held its annual meeting and banquet May 9, 1904, and elected the following officers: President, C. W. Partridge; Vice-president, J. P. Reardon; Secretary, R. Farquhar; Treasurer, W. H. Caffey; Executive Committee, F. W. Bevington, E. A. Freeman, W. H. Fingleton.

EIGHTH DISTRICT DENTAL SOCIETY.

The Eighth District Dental Society of New York State held its annual meeting at Buffalo, April 26, 1904, and elected the following officers: President, R. Murray, Buffalo; Vice-president, G. W. Pringle, Niagara Falls; Secretary, E. Muntz, Buffalo; Treasurer, L. Meisberger, Buffalo; Librarian, S. A. Freeman, Buffalo.

FOURTH DISTRICT DENTAL SOCIETY.

The Fourth District Dental Society of New York State met at Saratoga, April 19, 1904, and elected the following officers: President, W. S. Rose, Schenectady; Vice-president, A. T. Hawley, Waterford; Secretary, E. B. Rhinehart, Schenectady; Treasurer, E. Doolittle, Saratoga; Correspondent, J. Barraclough, Sandy Hill.

LEBANON VALLEY DENTAL ASSOCIATION.

The Lebanon Valley Dental Association held its annual meeting at Reading, Pa., May 18, 1904, and elected the following officers: President, H. W. Bohn, Reading; Vice-president, R. J. Wall, Harrisburg; Recording Secretary, H. J. Herbein, Pottsville; Corresponding Secretary, P. K. Filbert, Pottsville; Treasurer, C. B. Wagner, Lebanon.

SIXTH DISTRICT DENTAL SOCIETY.

The Sixth District Dental Society of New York State held its annual meeting at Binghamton, May 6, 1904, and elected the following officers: President, A. V. Needham, Oneida; Vice-president, W. J. LeSeuer, Oneonta; Secretary, F. W. McCall, Binghamton; Treasurer, H. L. Whitmarsh, Binghamton; Censor, M. H. Fish, New Berlin.

VERMONT STATE BOARD OF DENTAL EXAMINERS.

The Vermont State Board of Dental Examiners will meet at Montpelier, July 5, 1904, at 2 p. m., for the examination of candidates to practice dentistry. Headquarters will be at the Pavilion Hotel. Application blanks, together with rules and instructions to candidates, can be had on application to the Secretary. Application, together with the fee, $10, must be filed with the Secretary on or before June 27, 1904.

GEO. F. CHENEY, Secy., St. Johnsbury.

THIRD DISTRICT DENTAL SOCIETY.

The Third District Dental Society of New York State held its annual meeting at Albany, April 26, 1904, and elected the following officers: President, J. W. Canaday, Albany; Vice-president, J. L. Appleton, Albany; Secretary, C. E. Allen, Albany; Treasurer, P. S. Oakley, Troy; Correspondent, F. L. Ames, Albany; Editor, L. S. Blatner, Albany.

SOUTHERN WISCONSIN DENTAL ASSOCIATION.

The meeting place has been changed, and the Southern Wisconsin Dental Association will meet in Janesville, June 8-9, 1904. This promises to be the best meeting in the history of the Society, and members of the profession are cordially invited to be present.

C. W. Collver, Secy., Clinton.

BERKSHIRE DISTRICT DENTAL SOCIETY.

The Berkshire District Dental Society held its annual meeting at Pittsfield, Mass., May 2, 1904, and elected the following officers: Secretary and Councillor, W. D. Hill, Great Barrington; Treasurer, M. W. Flynn, Pittsfield; Executive Committee, W. H. Fallon, Pittsfield; E. A. Schillenger, Lee; L. F. Mullins, Great Barrington.

SOUTHEASTERN DISTRICT DENTAL SOCIETY.

The Southeastern District Dental Society held its annual meeting at Fall River, Mass., April 27, 1904, and elected the following officers: Secretary, A. L. Shockley, New Bedford; Treasurer, A. F. Wyman, New Bedford; Councillor, H. H. Filoon, Brockton; Executive Committee, F. M. Kennedy, N. A. Stanley and J. P. Tripp, all of New Bedford.

VALLEY DISTRICT DENTAL SOCIETY.

The Valley District Dental Society held its annual meeting at Springfield, Mass., May 2, 1904, and elected the following officers: Secretary, E. T. Dickinson, Northampton; Treasurer, J. S. Hurlbut, Jr., Springfield; Executive Committee, A. J. Doane, Northampton; F. H. Saunders, Westfield; C. W. Hale, Springfield; Councillor, A. J. Flanagan.

ALABAMA DENTAL ASSOCIATION.

The Alabama Dental Association held its annual meeting at Anniston, May 13, 1904, and elected the following officers: President, H. Clay Hassell, Tuscaloosa; First Vice-president, N. N. Vann, Attalla; Second Vice-president, C. L. Gunn, Gadsden; Treasurer, W. B. Fulton, Birmingham; Secretary, L. A. Crumley, Birmingham; State Examining Board, J. A. Hall, T. P. Whitby, R. B. Chapman, W. E. Proctor, P. R. Tunnstall; Executive Committee, H. C. Hassell, L. A. Crumley, H. D. Boyd, Jr., H. W. Randall. The next meeting will be held at Gadsden.

INDIAN TERRITORY DENTAL ASSOCIATION.

The Indian Territory Dental Association held its annual meeting at Muskogee, May 7, 1904, and elected the following officers: President, G. W. Day, Vinita; Vice-president, A. E. Bonnell, Muskogee; Secretary, F. A. Stickel, Jr., Muskogee; Treasurer, S. A. Long, South McAlester; Member Executive Committee, W. W. Bryant, Claremore.

NEW YORK STATE DENTAL SOCIETY.

The New York State Dental Society held its annual meeting at Albany, May 10-12, 1904, and elected the following officers: President, Wm. Jarvie, Brooklyn; Vice-president, W. A. White, Phelps; Secretary, W. C. Deane, New York; Treasurer, C. W. Stainton, Buffalo; Correspondent, Ellison Hillyer, Brooklyn.

ARKANSAS STATE DENTAL ASSOCIATION.

The annual meeting of the Arkansas State Dental Association was held at Little Rock, May 11, 1904, and the following officers were elected: President, C. C. Sims, Dardanelle; First Vice-president, A. L. Pendergrass, Helena; Second Vice-president, C. G. Farrow, Little Rock; Corresponding Secretary, W. D. Jacoway, Dardanelle; Secretary and Treasurer, R. W. Quarles, Van Buren.

TEXAS STATE DENTAL ASSOCIATION.

The Texas State Dental Association held its annual meeting at Corsicana, May 6, 1904, and elected the following officers: President, S. G. Duff, Greenville; First Vice-president, P. S. Turner, Belton; Second Vice-president, W. R. Rathborne, Cuero; Secretary and Treasurer, Bush Jones, Dallas; Member Executive Committee, G. W. Staples, Dallas. The next meeting will be held at Austin.

CALIFORNIA STATE DENTAL ASSOCIATION.

The California State Dental Association held its annual meeting at San Francisco, May 16-19, 1904, and elected the following officers: President, W. J. Taylor, Sacramento; First Vice-president, W. A. Knowles, San Francisco; Second Vice-president, O. P. Roller, Los Angeles; Recording Secretary, C. E. Post, San Francisco; Corresponding Secretary, J. L. Pease, Oakland; Treasurer, T. N. Inglehart, San Francisco.

KENTUCKY STATE DENTAL ASSOCIATION.

The Kentucky State Dental Association held its annual meeting at Louisville, May 17-19, 1904, and elected the following officers: President, J. C. Montgomery, Elizabethtown; Vice-president, Henry Pirtle, Louisville; Secretary, W. M. Randall, Louisville; Treasurer, F. R. Wilder, Louisville; Members Board of Trustees, S. H. Heavrin, Louisville; A. S. Kerley, Glasgow; McFerren Crow, Versailles; Max M. Eble, Louisville. The next meeting will be held at Frankfort.

IOWA STATE DENTAL SOCIETY.

The Iowa State Dental Society held its annual meeting at Des Moines, May 3-5, 1904, and elected the following officers: President, J. V. Conzett, Dubuque; Vice-president, J. B. Pherrin, Central City; Secretary, C. W. Bruner, Toledo; Treasurer, M. E. Reynard, Osceola; Executive Committee, W. R. Clack, Clear Lake; J. B. Monfort, Fairfield; H. L. Madison, Burlington. The next meeting will be held at Des Moines. The papers will be published in the DENTAL DIGEST.

UNIVERSITY OF MARYLAND DENTAL DEPARTMENT ALUMNI ASSOCIATION.

The Alumni Association of the Dental Department of the University of Maryland held its first annual banquet at Baltimore, April 30, 1904, and elected the following officers: President, C. J. Grieves, Baltimore; First Vice-president, D. O. M. LeCron, St. Louis; Second Vice-president, W. E. Diffenderfer, Washington; Third Vice-president, W. R. Pond, Rutland, Vt.; Secretary and Treasurer, T. O. Heatwole, Baltimore.

NATIONAL CAPITAL DENTAL SOCIETY.

The National Capital Dental Society was organized and incorporated May 18, 1904, at Washington, D. C., and the following officers were elected: President, James A. Hunter; Vice-president, W. B. Daly; Recording Secretary, Starr Parsons; Corresponding Secretary, J. K. Halley; Treasurer, J. B. Schafhirt; Librarian, Chester Beatty. The Society has adopted the code of ethics of the National Dental Association, and has a perpetual charter under the laws of the District of Columbia. It starts with a membership of nineteen and has the assurance of about twelve more at the next meeting.

J. K. HALLEY, Cor. Secy.

DENTAL COMMISSIONERS OF CONNECTICUT.

The Dental Commissioners of the State of Connecticut hereby give notice that they will meet at Hartford, July 14-16, 1904, to examine applicants for license to practice dentistry, and for the transaction of any other proper business. The practical examination in operative and prosthetic dentistry will be held July 14, at 9 a. m., in Putnam Phalanx Armory, corner Haynes and Pearl Streets. The written theoretic examination will be held July 15 and 16, at the Capitol. All applicants should apply to the Recorder for proper blanks, and for the revised rules for conducting the examinations. Application blanks must be carefully filled in and sworn to, and with fee, twenty-five dollars ($25.00) (money order or certified check), filed with the Recorder on or before July 7, 1904.

By direction of the Dental Commissioners.

J. TENNEY BARKER,
Recorder, Wallingford.

PENNSYLVANIA STATE DENTAL SOCIETY.

The thirty-sixth annual meeting of the Pennsylvania State Dental Society will be held at Hotel Sterling, Wilkesbarre, July 12-14, 1904. Every effort has been put forth to make this the best and most interesting of this Society. The executive committee promises a very full program, including among its essayists Dr. B. Holly Smith of Baltimore, Drs. M. H. Cryer and E. C. Kirk of Philadelphia, Dr. Gordon White of Nashville and Dr. Anema of the Netherlands. A number of prominent clinicians will demonstrate various specialties of dentistry. All reputable members of the profession are cordially invited to attend the meeting.

GEORGE W. CUPIT, Secy., Philadelphia.

NEW JERSEY STATE DENTAL SOCIETY.

The thirty-fourth annual meeting of the New Jersey State Dental Society will convene in the Auditorium, Asbury Park, at 10 a. m., July 20, and continue in session Thursday and Friday. Asbury Park is one of the great Atlantic Coast watering places, contiguous to New York and Philadelphia. The Auditorium will hold 3,000 people and is open on every side. Fifty clinics will be given by men from north, south, east and west, most eminent in their profession, and will include the latest advances in all that pertains to operative and mechanical dentistry. The essays will consist of five already accepted and the best obtainable. Exhibitors' day is Wednesday, July 20, when each exhibitor will hold a reception. Members and visitors are requested to be on hand early in order to take advantage of this opportunity to see the latest instruments, appliances, etc. The social members and visiting friends will, as usual, be provided for, and a smoker has been arranged for Thursday evening at 10:30. The Columbia Hotel will be headquarters, with rates from $2.50 to $3.00 a day. Those desiring rooms must write before July 1. A program giving fuller information will be mailed later.

CHAS. A. MEEKER, Secy., 29 Fulton St., Newark.

ILLINOIS STATE DENTAL SOCIETY.

At the fortieth annual meeting of the Illinois State Dental Society, held in Peoria, May 10-12, 1904, the following officers were elected: President, C. N. Johnson, Chicago. Vice-President, W. F. Whalen, Peoria. Secretary, Elgin MaWhinney, Chicago. Treasurer, Chas. P. Pruyn, Chicago. Librarian, J. T. Cummins, Metropolis City. New Members of Executive Council, G. E. Warren, Pontiac; O. L. Frazee, Springfield; C. E. Bentley, Chicago. Chairman Executive Committee, M. L. Hanaford, Rockford. Committee on Science and Literature, E. H. Allen, Freeport. Com. on Art and Invention, J. H. Prothero, Chicago. Supervisor of Clinics, S. F. Duncan, Joliet. Local Committee of Arrangements, L. W. Skidmore, Moline. Committee on Infraction of Code of Ethics, C. B. Rohland, Alton; A. J. Elmer, Rochelle; R. J. Cruise, Chicago. Examiners, Edmund Noyes, Chicago; C. B. Sawyer, Jacksonville; T. F. Henry, Streator. Ad Interim Committee, D. M. Gallie, Chicago; C. N. Johnson, Chicago; J. G. Reid,

Chicago. Committee on Necrology, Edmund Noyes, Chicago; C. R. E. Koch, Chicago; C. B. Rohland, Alton. Publication Committee, Elgin MaWhinney, Chicago; T. L. Gilmer, Chicago; J. G. Reid, Chicago. Editor of Transactions, Edmund Noyes, Chicago. The forty-first annual meeting will be held in Moline, May 9-11, 1905.

ELGIN MAWHINNEY, Secretary.

RESOLUTIONS ON DEATH OF DR. EDGAR D. SWAIN.

The Chicago Dental Society now in session offers this expression of our grief at the sudden death of Dr. Edgar D. Swain.

For more than thirty years he was one of the group of honored and trusted men who conducted the affairs of this and the State Society. He performed every service and received every honor that these Societies could ask or confer upon him, and his name was seldom absent from the list of officers or important committees.

His strong, sincere and positive nature won for him, far more than is usual, the respect and honor of all who knew him and the warm affection of those who were nearest to him. These qualities and a generous disposition made him especially a friend and helper of worthy young men. No one ever heard him speak a harsh or unkind word of anyone, unless for some act of meanness or sordidness.

This Society, the State Society, and the dental profession of Illinois owe him a large debt of gratitude, and his memory will long be cherished among us. Those who know him well will never cease to miss his presence and to mourn his loss.

Resolved, That the above be placed upon the records of this Society, and that copies be sent to his family and to the dental journals.

EDMUND NOYES,
J. G. REID,
GEO. J. DENNIS,
Committee.

RESOLUTIONS ON DEATH OF DR. I. P. WILSON.

Whereas, since the last meeting of this Society Death removed from us, on the 9th day of March, 1904, one of our most honored and esteemed members, Dr. I. P. Wilson of Burlington, we wish to give this expression as to his worth and character, and as to the esteem in which he was held by this Society and the profession of the state.

Dr. Wilson was an Iowa dentist, having come to the state from Ohio when about fifteen years of age. He studied dentistry with Dr. Tullus of Iowa City, and later graduated from the Missouri Dental College. He spent the whole of his professional life in Iowa, the greater part of the time in Burlington. For forty-one years he was a member of this Society, being prominently connected with its early history. Dr. Wilson was devoted to his profession, never being satisfied with present attainments, but constantly pressing forward and keeping abreast of the advances made by the

profession. He always regarded this Society as indispensable to his advancement. As an instructor in the Dental Department, S. U. I., and later in the Keokuk Dental College, he endeared himself to the hearts of the students. He was preeminently the friend of the young men of the profession, and his influence was that of an honest, upright, professional Christian gentleman. Therefore be it

Resolved, That this Society hereby testify to the loss we experience in the death of Dr. Wilson, and extend our sincere sympathy to Mrs. Wilson and the family in their bereavement; that these resolutions be spread upon the records of this Society, and that a copy be sent to Mrs. Wilson and the family, and to the dental journals for publication.

J. B. MONFORT,
A. W. DANA,
ANNA H. JOY,
Committee.

News Summary.

W. P. TERRY, 35 years old, a dentist of Denver, died April 8, 1904.

E. GRIFFON, 79 years old, a dentist of New York, died May 10, 1904.

J. C. PAYNTER, 85 years old, a dentist of Philadelphia, died May 13, 1904.

C. J. CHAMBERS, 35 years old, a dentist of Osceola, Pa., died May 6, 1904.

JOSEPH JOHNSON, 36 years old, a dentist of Esplen, Pa., died May 11, 1904.

C. S. DUSENBURY, 71 years old, a retired dentist of Towanda, Pa., died April 29, 1904.

J. F. DEPLANTUE, 94 years old, a dentist at Tompkinsville, S. I., died April 29, 1904.

H. E. HERREN, 25 years old, a dentist at Troy, Idaho, died April 12, 1904, of typhoid fever.

H. H. HORD, 28 years old, a dentist at Springfield, Ky., died May 5, 1904, of typhoid fever.

W. C. BALL, 33 years old, a dentist of Gibson City, Ill., died April 29, 1904, of tuberculosis.

W. W. HALL, 45 years old, a dentist of McGregor, Tex., was accidentally killed May 21, 1904.

MRS. BUCKLEY, wife of Dr. W. H. Buckley of Little Rock, Ark., died May 21, 1904, of appendicitis.

A. J. HOMFELD, 37 years old, a dentist of Valpo, Ind., died April 26, 1904, of hemorrhage of the lungs.

W. F. KLOCK, 49 years old, a dentist of Syracuse, N. Y., died April 29, 1904, from an overdose of morphin.

G. C. EIGHME, 40 years old, a dentist at Bridgeport, Conn., was killed in an automobile accident April 17, 1904.

R. L. STEWART, 30 years old, a dentist of Newark, N. J., died May 9, 1904.

J. B. PRESCOTT, 72 years old, a dentist of Manchester, N. H., died April 14, 1904.

JAMES WEED, 91 years old, a retired dentist of Muscatine, Ia., died April 20, 1904.

C. T. MEAKER, 50 years old, a dentist at Carbondale, Pa., died May 9, 1904, of pneumonia.

T. M. ROUDEBUSH, 57 years old, a dentist of Covington, Ky., died April 25, 1904, from an attack of grip.

N. E. DICKEY, a dentist of Fairmount, Ind., has disappeared, and his friends are becoming anxious about him.

J. M. LIONBERGER, 70 years old, a dentist of Dallas, and formerly in practice at Carthage, Ill., died April 9, 1904.

GOOD MATERIAL SPOILED.—Dr. M. A. Mason says that dental and medical colleges spoil hundreds of good farmers each year.

S. J. WOOD, 65 years old, and formerly in the practice of dentistry in Rochester, N. Y., died suddenly in Philadelphia, April 24, 1904.

PERHAPS THE DOCTOR WILL BE ABLE TO SLEEP NOW.—"Miss Vidger, nurse, reports over the telephone that Dr. Craig's baby has a tooth."—*Keosauqua, Ia., Republican.*

IMPRESSION TAKING.—W. M. Wunder, in *Dominion.* When the impression has been taken in plaster of Paris, do not forget to scrape what represents soft parts on the model.

ANILIN STAINS.—To remove them from the fingers the *Practical Druggist* recommends a solution of seven parts sodium nitrate and fifteen parts dilute sulfuric acid in five parts of water.

DEVILISH.—The good dean must have been a bit rattled at the commencement exercises when he announced: "The Rev. Dr. Blank will now deliver the Bacchanalian Address."—*Dent. O. & L.*

ANOTHER IDOL BROKEN.—An eminent physician (*Indianapolis Journal*) says there is no such thing as brain fag. Now, why does he want to go and take away from us the most convenient term science has ever furnished us lazy mortals?

DARK JOINTS.—L. W. Jordan, in *Summary.* If you don't want any dark joints when sections are used, pack pink rubber against the joints, letting it extend at least one-eighth of an inch beyond them. Do not cover the pins. Pink rubber is cheaper than gold.

BANKRUPT.—J. A. Brooks, a dentist of Erie, Pa., has had a petition in involuntary bankruptcy filed against him by various creditors, whose claims amount to about $2,500.—Charlotte E. Benton, a dentist of New York City, filed a petition in bankruptcy April 27, 1904, listing liabilities at $5,600 and nominal assets at $60,100, $100 being in cash.

DEAD BEATS BARRED.—The dentists of Sterling, Ill., have agreed not to do any dental work for those individuals who do not pay their bills, and the local society will maintain a blacklist. The physicians in the town are cooperating with the dentists in the matter.

CAUTION.—Don't light the Low formaldehyde lamp with a match, as it ruins the platinum cone very quickly. First light an ordinary alcohol lamp or a very small Bunsen jet, and heat the cone in this. You will be repaid for the effort.—*P. W. Smith,* Palmyra, N. Y.

DENTIST WINS SUIT.—A dentist in New York recently sued a patient for $145 for services rendered. The defendant, a horseman, claimed that he had given the dentist tips on the races that were worth at least $300, but the jury would not recognize his claim and gave judgment for the dentist.

TEETHING.—The doctor had promised to mail the finished denture to the patient, but for some reason delayed the matter, whereupon the lady wrote him: "I have looked in vain for the new teeth, and, as is usual when people have teeth coming, I am getting rather peevish." There was no further delay. —*Dent. Off. & Lab.*

POTASSIUM IODID HYPODERMICALLY IN A SYPHILITIC GUMMA.—Labadie, LaGrave and Rollin (*Jour. de med. interne*) have cured a syphilitic gumma without internal medication by the local hypodermic injection of potassium iodid, 2 c.c. daily. The gumma disappeared after the seventh injection. The treatment is extremely painful.—*N. Y. Med. Jour.*

FIRES.—J. N. McClish, Healdsburg, Cal., April 30, loss $100.—I. Unger, Detroit, April 28, loss $500.—W. C. Grover, Mahanoy City, Pa., April 30, loss $2,000.—Philadelphia Dental Company, Philadelphia, May 8, loss $50.—J. B. Askew, Jr., Vicksburg, Miss., April 15, loss $3,000, insurance $1,000.—Edward Hoag, South Milwaukee, Wis., May 3, loss $25.

TO PREVENT FRACTURE OF FACINGS.—S. J. Spence, in *Era.* When they are backed and then soldered to a strip of metal, as when facings are used in long bites in plate work, it is essential that the strip of metal shall project beyond the backing and reach under the end of the facing, so that the tooth may rest on and be supported by said strip and not by its pins only.

STILL MORE EASY PEOPLE.—A painless dental company in Galesburg recently left the town hurriedly, owing several bills.—A dental parlor in Trenton was recently sold on a chattel mortgage by complaint of a creditor, who was tired of waiting for his money, and a dental parlor at Sedalia, Mo., has been closed on a judgment obtained by a newspaper, which was unable to collect for advertising.

BONE-IMPLANTATION.—Professor Cornil of Paris stated that the investigations of Bartels have demonstrated that dead and living pieces of bone are not equally efficacious in bone-implantation, and that it is premature to infer that the living pieces remain alive. Both implantations were replaced by fresh bony tissue, but the living pieces were more valuable for closing up bony cavities because the granulations were more active and abundant. This fact Bartels has demonstrated in the cranial bone of the dog and other animals.—*Medical News.*

BOGUS COLLECTION AGENCY.—A man is reported to be fleecing dentists and physicians in various parts of the country by means of an old swindle. He claims to represent a collection agency, and guarantees to collect two-thirds of all old accounts given him. A subscription to the agency is $40 yearly, payable in advance, and after collecting same and any of the good accounts he can he skips out.

LIBELOUS LANGUAGE.—A physician writing in the *Medical Review* says that many women whom he observes at the theater are "hebetudinous." Unless the author of the allegation is a psychologist, possessing propensities for spontaneous action in the subconscious mind, arriving at conclusions by a process of ratiocination characteristic of phrenologists, his own case may be diagnosed as dictionariomania.—*St. Louis Republic.*

MEDICAL VIEW OF THE CAUSES OF HIGH PALATE.—Grosheintz (*Arch. f. Laryngol.*) believes that the high, narrow palate is usually associated with a generally narrow configuration of the upper part of the face (leptoprosopy). Narrow nasal cavities (leptorrhiny) and narrow orbits are usually associated with high palate. High palate rests as a rule upon inborn facial peculiarity of skull formation, and is not influenced by causes operating after birth.—*Med. Review of Reviews.*

TO PREVENT BASE RUBBER FROM RUNNING INTO THE GUM PINK.—J. R. Herzog, in *Summary.* Take care in packing and flasking to have the vents made only at the back of the flask. Close the flask carefully when packed, bringing the front part down first, then carefully and slowly bringing back part of flask together. This causes all surplus rubber to run into the vents at the rear of the flask, leaving the front portion of pink rubber just where it was first placed in packing.

ALL GREEK TO THEM.—Æsculapius was giving a lecture.

"Finally," said the father of medicine, "write your prescriptions in Latin and your bills in good plain English."

"But," asked the students, "where does our native tongue come in?"

"That's just it," he answered; "the patient's condition is usually Greek to you."

Cheered by this exposition, they went forth to practice their art.—*New York Sun.*

ACIDITY IN THE MOUTH.—We have a great many patients from the age of fourteen years upward who suffer terribly from the ravages of caries. Most dentists cure the disease by filling all decayed teeth, but neglect to make the patient attentive to the cause, which generally is in the saliva. When I began to practice, thirteen years ago, I advised my patients to wash out their mouths often with a solution of soda bicarbonate, and the results were pretty good; but wishing still better success, I have had some very hard tabloids of soda bicarbonate made, and advise my patients to put one-quarter of a tabloid between the upper molar and the cheek before going to bed, one evening on the right, another evening on the left side of the mouth. in this way the soda bicarbonate dissolves very slowly all night and neutralizes the acid saliva.—EUGENE J. WETZEL, *International.*

FALSE TOOTH SAVES LIFE.—A physician in New York recently returned to his room about midnight from a professional call. He turned on the gas, but it would not light, and he went to bed without thinking to turn it off. Later the gas began to flow, and almost asphyxiated him. He attributes his escape to the fact that the natural tendency of a person asphyxiating with gas is to close the teeth tightly, and he clenched his teeth so hard as to break off a facing from a porcelain bridge in his mouth, which woke him up.

CATAPHORESIS IN GOUT.—Dr. Charles Begg (*Edinburg Med. Jour.*) claims to have obtained excellent results in the treatment of chronic gout and rheumatoid arthritis by this procedure. Two methods may be employed: either the joint is immersed in a solution of the drug to be employed, the positive electrode being placed in the bath and the negative on an indifferent part of the body, or the positive electrode is kept as wet as possible by frequent applications of the solution. The author employs a large negative electrode and a small button-shaped positive electrode.

CONTRACTED DENTAL ARCHES.—H. Baldwin, in *Brit. Dent. Jour.* In cases of contracted dental arches very frequently it is best to expand both upper and lower, and I have not found the wearing of two plates at once much objected to by the patients. I use split vulcanite plates with a piano-wire spring, and almost always make the plate cap the back teeth, and instruct the patients to wear them all night and as much during the day as they conveniently can. To make the plates slip in tightly it is very important to slightly cut into the lingual surfaces of the bicuspids and perhaps the molars on the model before vulcanizing on it.

AN EASY WAY TO SAVE FINE GOLD DUST.—Where a crown or a piece of gold work is being dressed down with a stone in the handpiece, it is often unhandy to grind over some receptacle to catch the particles of gold. The difficulty may be obviated if you will provide yourself with a good-sized piece of woolly carpet for an apron. This allows one to grind in the handiest position, at the same time entangling the flying gold particles in the carpet. Keep the apron rolled up when not in use. This in time may be burned to secure this gold—as is done in our mints—or the particles may be dusted out into a paper and collected. The amount of gold thus saved will surprise you.—*Ex.*

PREPARATION OF THE MOUTH FOR LOCAL ANESTHESIA.—M. I. Schamberg, in *Gazette.* I follow out in my practice the thorough rinsing of the patient's mouth with a solution of potassium permanganate prior to the performance of any operation. While it is not a pleasant preparation as a mouthwash, I employ it because of its efficacy. It is a decided deodorant, a good oxidizer, and puts the mouth into as nearly a sterile condition as is possible by the use of a harmless preparation. Following this I swab the gum with absorbent cotton dipped in ninety-five per cent alcohol. I then take a drop of carbolic acid and apply it to the point at which I intend making my puncture, so as to anesthetize as well as sterilize the point of entrance of the needle. All my instruments, including the syringe and needle, are sterilized by boiling. I most frequently employ beta eucain, inasmuch as it can be boiled without any deterioration of the drug.

DANGER OF BEING ALIVE.—Drink water and get typhoid fever. Drink milk and get tuberculosis. Drink whisky and get the jim-jams. Eat soup and get Bright's disease. Eat meat and encourage apoplexy. Eat oysters and acquire toxemia. Eat vegetables and weaken the system. Eat dessert and take to paresis. Smoke cigarets and die early. Smoke cigars and get catarrh. Drink coffee and obtain nervous prostration. Drink wine and get the gout. In order to be entirely healthy one must eat nothing, drink nothing, smoke nothing, and even before breathing one should make sure that the air has been properly sterilized.—*Southwestern World.*

DIVERSIFIED TALENT REQUISITE IN THE DENTIST.—We have often contended that a more diversified talent is required for the successful practice of dentistry than is demanded by any other profession. In the legal, medical, or clerical profession the one all-important consideration, aside from the moral and social requirements which should properly be considered as the foundation of the structure, is that of a well-trained mind. In dentistry the requirements, apart from the aforesaid foundation, are threefold—intellectual, mechanical, and artistic—absence of or insufficiency in any one of these making it impossible for one to attain to a high professional position.—J. CHASE, *Hints.*

RELATIONS OF THE ORAL CAVITY TO THE ASSOCIATED PARTS.—A habit acquired by the dentist of regarding every problem presented to him in its broadest light will cultivate in him the faculty of intelligent diagnosis. I would urge upon every ambitious dentist to procure for himself a tongue depressor and a nasal speculum (your mouth mirror will do for a laryngeal mirror), accustom himself to their use, and use them frequently. You will be surprised to see how an intelligent use of these few instruments, with proper illumination, will interest you and enlarge your views as to the relations of the oral cavity to its associated spaces, the nares, naso-pharynx and fauces; to say nothing of those lurking-places of disease—the antrum of Highmore, the sphenoidal and ethmoidal cells.—J. H. MARTINDALE, *Pacific Gazette.*

ACCIDENTS.—May 21, L. Caldwell, a dentist of Birmingham, Ala., was severely injured by a pile of brick, which fell from the top of a building he was passing.—April 30, J. M. McClish, a dentist of Healdsburg, Cal., was badly injured by the explosion of a vulcanizer.—James H. Kane, a dentist of Hartford, Conn., is recovering from an attack of blood poisoning, brought on by a scratch from one of his instruments.—May 12, Lena Watson, a dentist of Hammond, Ind., was badly injured by the explosion of a vulcanizer.—April 28, T. A. Rose, a dentist of Sioux City, Ia., was severely injured in a runaway.—April 14, W. A. Purcell, a dentist of Owensboro, Ky., was badly injured by being thrown from a street car in Denver.—April 30, H. L. Rollins, a dentist of Portland, Me., was badly injured and burned by the explosion of a vulvanizer.—April 22, J. D. Monkman, a dentist of Vermontville, Mich., was badly injured in a runaway.—April 15, the gasoline furnace in the dental office of J. D. Askew, Jr., Vicksburg, Miss., exploded and set the room on fire.—J. M. McDowell, a dentist of Chester, Pa., is recovering from a severe attack of nosebleed, which at one time threatened to be fatal.

ILLEGAL PRACTITIONERS.—May 14, a man was arrested in Chico, Cal., for practising dentistry without a license.—April 21, a man was fined $50 in Kansas City, Mo., for practising dentistry without a license.—May 4, a man was held in $500 bail in Brooklyn for the illegal practice of dentistry.—April 16, the proprietors of a painless dental parlor in Salt Lake City, Utah, were acquitted of the charge of practising dentistry without a license. There was no doubt of their technical guilt, but they claimed that they were being persecuted because they advertised, and the jury, unfortunately, believed them. Another suit will be brought at once.—April 15, four men in Seattle, Wash., were convicted of practising dentistry without a license, and each was fined $50 and costs.

DIVORCES.—Florence E. Barker is suing her husband, Dr. G. H. Barker, a dentist of New York, for divorce.—Mrs. J. H. Cowan is suing her husband, a dentist of Cortland, New York, for divorce.—Emily F. Dunn has sued her husband, J. N. Dunn, a dentist of San Francisco, for divorce.—L. A. Effron, a dentist of Philadelphia, was recently granted a divorce from his wife.—Catherine Fowler has been granted a divorce from her husband, J. W. Fowler, a dentist of Chicago.—Isabel Johnson is suing her husband, George E. Johnson, a dentist of Fort Wayne, for divorce.—A. Y. Munson, a dentist of Toledo, has been sued for divorce by his wife.—Lucy M. Redmond has sued her husban, Young E. Redmond, a dentist of Nashville, for divorce.—Marian Valadier has been granted a divorce from her husband, C. A. Valadier, a dentist of New York.

DOUBLE TONGUE.—By Dr. M. A. Tate (*Cincinnati Lancet-Clinic*). The author reports a case of a male infant whose frenum linguæ was so large that it held the tongue down to the floor of the mouth. The frenum was ruptured, but still the child could not nurse. Every known expedient was resorted to to make the child suckle, but all proved unsuccessful. Another examination was made and it was found that the tongue was very thick and that the child could not protrude it beyond the gums. It was found that the frenum extended underneath the tongue, and it was cut by means of scissors; it was then discovered that the child had a double tongue, the smaller being beneath the larger. Inquiry revealed that the mother had a ridge of flesh on the under surface of the tongue, and it is probable that at birth she also had a double tongue. Two weeks later the child was nursing without interference and the superfluous tongue was undergoing rapid atrophy.

DAMAGE SUITS.—A dentist in Los Angeles has been sued for $25,000 damages for alleged malpractice by the mother of a boy.—A man in Worcester, Mass., recently sued a dentist for $3,000 damages, claiming that the dentist left the root of a tooth in the plaintiff's mouth, and that it caused blood-poisoning. Judgment was given for the dentist.—A dentist in Fall River, Mass., is being sued by the husband of a woman who claims that the dentist assaulted her while she was under the influence of an anesthetic.—A man in Joplin, Mo., has sued a dentist for $300 damages, claiming that his health was injured by improper dental work.—A woman in New York sued a dentist

for $5,000 damages, alleging that he detained her in his office for about three hours and finally removed a crown which he had placed in her mouth, because she would not pay him. The jury decided in favor of the dentist.—A man in Philadelphia has sued a dentist for $10,000 damages, alleging that the latter alienated the affections of his wife while doing dental work for her.

SECURING DRYNESS AND ASEPSIS IN ROOT-CANALS.—G. R. Gard, in *Summary.* After having applied the dam I remove all the dead pulp possible, cleanse the canal thoroughly with alcohol, then insert into it a silver broach about four inches long, letting the end protrude out of the mouth as far as it will. If there be more than one canal, put the broach into each one and twist the other ends together, then hold the flame under the ends of the broach until the patient can bear the heat no longer. You will then have the canal both dry and aseptic. Form a paste with oil of cloves and aristol (if the paste is a day or two old it is better), and work into the canals. Should the canals not be thoroughly dry at the apex the alcohol will readily take up the moisture, also the oil of cloves, and carry the paste to the ends of the root, which will seal the apical foramen. Then insert a gutta-percha point (in small canals no point is required). This is a very aseptic filling.

DIAGNOSING DISEASE OF THE MAXILLARY ANTRUM.—S. Pietro (*Arch. Ital. di Otol. e Laryn.; Jour. of Eye, Ear, and Throat Diseases*) calls attention to a new method of diagnosing disease of the antrum of Highmore. The instruments required are two rubber tubes of the length of one hundred and sixty centimeters, each having at one end a rubber tip for the ear and at the other a cylindrical tube three centimeters in length, and a tuning-fork of sixty-four or ninety-six vibrations. The tips of the tubes are placed in the ears and the glass tube on the outer wall of the antrum, the cuspid fossa, corresponding points on the alveolar border, the free margins of the molar teeth, etc. The tuning-fork is then set in vibration and placed on the dorsum of the nose. If either antrum contains pus the vibrations will be heard more distinctly on that side. The writer has made observations on dead bodies and on the living subject, and claims this to be our most certain method of diagnosing antrum disease.

PAIN.—Ritter (*Archiv. für klin. Chir.*) makes the announcement that he has established by his research that the pain from a serous effusion is not caused by the mechanical action of the fluid, but by its concentration. The constant destruction of albumin produces rapidly a very concentrated fluid, which causes intense pain, but as more serum mixes with it, as the dilution increases the pain diminishes. Bier has called attention to the fact that his methods of inducing artificial hyperemia or venous congestion reduce the pain to a marked degree. Ritter shows that this alleviation of the pain is due to the dilution from the hyperemia or venous congestion in the concentrated effusion. We must assist nature in this process of dilution, and we will be able in this way to systematically alleviate pain. He has been most gratifyingly successful in the application of these principles to the treatment of severe, painful burns, inducing venous congestion according to Bier's directions.

INFLUENCE OF HYSTERECTOMY UPON THE DENTAL ORGANS.—Dr. Galippe (*Le Rev. de Stom.—Cosmos*) refers to the changes which occur in women after hysterectomy, and describes a particular case in which, after the performance of the operation, and concomitant with hepatic disorders, the teeth, besides becoming friable, assumed a dark yellow coloration, and the upper and lower incisors and cuspids underwent rapid dissolution. The patient was put under appropriate treatment, and in a short time the phenomena subsided, the teeth regained their natural color, and the erosion came apparently to a standstill. These phenomena the author attributes to perverted nutrition. Curatula and Tarolli have found that hysterectomy in dogs is followed by a retention of phosphates, an observation which has been confirmed by Pinzani. This phenomenon Galippe believes to be the result of insufficient oxidation of organic phosphorus. The author examined the patient before and after the operation, and feels certain that the teeth were the seat of physical and chemical changes.

ALOPECIA AREATA OF THE MUSTACHE OF DENTAL ORIGIN.—Milian (*Ann. de Derm. et de Syph.*) reported the following interesting case of alopecia areata: A man, aged thirty-five years, who had suffered much from carious teeth, of which he had a great number, presented a patch of alopecia areata in the mustache over the upper right lateral incisor. This tooth after a severe neuralgia of both jaws had remained very sensitive, and the patch of alopecia had developed over it at the same time vesicles identical in appearance with those of herpes had appeared on the corresponding part of the gum. The hairs about the borders of the patch were easily extracted, and presented the usual appearance observed in this disease. The skin was thinned and presented a marked anesthesia. There were no other patches of alopecia. The patient was directed to have the mouth cleansed and the teeth looked after by a dentist, and was given quinin internally in moderate doses. Shortly after the jaws had been put in good condition, the sensitive incisor having been extracted, the patch of alopecia ceased to extend. Later the neuralgia ceased, the sensibility of the skin returned, and at the end of about four months the plaque was completely covered with hair.

MARRIAGES.—J. R. Bone, a dentist of Cleveland, was married to Miss Laura W. Gates of Oxford, O., May 2.—George W. Bourne, a dentist of Newark, O., was married to Miss Julia Tyrer of Newark, April 19.—A. G. Coggin, a dentist of Hubbell, Mich., was married April 25.—L. S. Effron, a dentist of Philadelphia, was married to Miss Alice B. Blackman of Philadelphia, May 4.—J. V. Faulkner, a dentist of Oneida, N. Y., was married to Miss Jessie C. Lyle of Oneida, April 27.—J. E. Herman, a dentist of Sandusky, O., was married to Miss Lucy Ott of Norwalk, O., May 7.—Dan Lloyd, a dentist of Portsmouth, O., was married to Miss Lettie Watkins of Portsmouth, February 14.—H. C. McClellan, a dentist of Middletown, O., was married to Miss Margaret Malloy of Goshen, May 12.—G. A. Mochel, a dentist of Fremont, O., was married to Miss Rose Minich of Gibsonburg, O., April 21.—T. A. Phillips, a dentist of Canal Dover, O., was married to Miss Florence Beiter of New Philadelphia, May 4.—Walter Siegfried, a dentist of Franklin, O.,

was married to Miss Anna Governey of Franklin, April 6.—H. Turner, a dentist of Moore's Hill, Ind., was married to Miss Mabel Johnson of Sparta, Ind., May 4.

ROBBERIES.—C. F. Lemon, Ventura, Cal., May 9, $50.—A. H. Bourque, West Newton, Mass., May 8, $40.—F. A. Leland, Marlboro, Mass., May 6, $25.—R. O. Clark, Marlboro, Mass., May 6, $15.—C. T. Warner, Nashua, N. H., May 6, $55.—S. B. Johnston, Newark, N. J., May 11, $20.—R. L. Hamilton, Syracuse, N. Y., May 13, $30.—J. E. Cummings, Syracuse, N. Y., May 13, $25.—H. T. Hawkins, Youngstown, O., May 4, $50.—A. E. Gray, Columbus, O., May 8, $50.—J. W. Grant, Providence, R. I., May 7, $100.

EXAMINING BOARD AFFAIRS.—May 10, the governor appointed W. H. DeFord, of Jefferson, and F. H. Rule, of Ackley, members of the Iowa board to succeed T. I. James and C. S. Searles.—The Louisiana board met April 20 and elected P. H. Wright of Oxford president and P. P. Walker of Brandon secretary.—April 27 the governor appointed W. W. Dunbracco of Baltimore a member of the Maryland board. The board met May 4 and elected H. A. Wilson president and F. F. Drew secretary and treasurer.—At the recent meeting of the Mississippi board 42 out of 50 applicants were successful in passing the examination.—At the last meeting of the Oklahoma board 5 out of 9 applicants passed the examination.—May 9 the Oregon board began pro quo warranto proceedings to prevent a recent appointee from assuming his office as a member of the board.

CONSULTATION AMONG DENTISTS.—In all cases of doubtful diagnosis, uncertainty respecting proper treatment, or when a fatal termination is feared, the physician avails himself of the aid and counsel of his fellow practitioner. In like manner consultation should constitute an important factor in the direction of an acceptable aid to our success. Not that our opinions or our proceedings are of such a character that they involve a question of life or death; not that we are incapable in a general way of doing the best we know how under the circumstances; but that we may by thus deliberating do better than we previously knew how, and having done this we should have the frankness to admit the same. The consultation of the dentist must of necessity differ from that of the physician; it need not be a hurried consideration of symptoms and signs, followed by extreme or heroic treatment, but instead of this it may be a deliberate weighing of the facts, and this should be and I think is the primary function of most dental societies. It is chiefly at the meetings of these organizations that our consultations should take place. The self-sufficiency which fails to avail itself of such aid and co-operation as that furnished in the form of consultation through dental societies is justly amenable to censure.—I. N. BROOMELL, *Brief.*

EFFECT OF AGITATION UPON THE MICROBE.—Most germicides are more or less poisonous to the human organism, and therefore the destruction of bacteria in food and drink by the addition of powerful antiseptics is not available. It is well known, however, that certain physical agencies exert a germicidal action, as, for example, light, electricity, and heat, and to these must be added the curious influence of mechanical shock. According to a number

of interesting experiments on this point there can be little doubt that the vitality of lower organisms is influenced by agitation, even to the extent of total destruction. Thus by submitting to violent agitation certain bacterial cultures it has been found that the number of germs diminished to less than one-tenth of that originally present. Ultimately by prolonging the treatment the liquid was entirely freed from active germs and failed to develop further organisms, even when placed under favorable conditions. By adding some glass beads to the bacterial culture the effect was more prompt, the liquid becoming sterile. In another experiment bacterial cultures were allowed to stand in the engine-room of a large manufactory in which an incessant vibration was produced by the strokes of the engine, with the result that after four days the vitality of the germs was completely destroyed, while in the control samples, which were left in a quiet place, the germs had retained their activity. It would appear from this interesting experiment that minute vibrations have the power of hindering the growth of micro-organisms as well as violent shocks, while if either treatment be continued the germs at length die.—*Lancet.*

Salicylic Acid in Strawberries.—The strawberry season is at hand, and this delicious fruit is not without its advocates as to its advantages in rheumatism. Indeed, some have gone the length of saying that strawberries may not only be taken with impunity by the rheumatic and gouty, but with distinct advantage if not relief. It is a somewhat curious coincidence, therefore, that in the strawberry the presence of salicylic acid, which is of course a specific in acute rheumatism, has been definitely established. As a matter of fact, salicylic acid would appear to be a normal constituent of most fruits. At any rate, this acid has been found not only in the strawberry but in grapes, apples, plums, oranges, and cherries, although the amount is probably less than one milligram (1-64th of a grain) per kilogram (two pounds) of fruit. It is therefore hardly possible that the strawberry should have any specific medicinal effect attributal to the salicylic acid present. A few weeks back there was recorded in our columns a formidable case of sprue in which strawberries in the diet appeared to act as a specific in the disease. As is well known, most fruits possess anti-scorbutic properties and contain salts which readily become converted into carbonates in the system, thus tending to maintain an alkaline condition and preventing the formation of acid deposits. The fact, however, that salicylic acid exists normally in fruits is of interest in connection with the use of salicylic acid as a preservative in jams. It is possible that some magistrates may regard this natural occurrence of the acid in fruit as a plausible defence in those cases in which proceedings are taken for the addition of small quantities of the preservative.—*Lancet.*

Adenitis.—By Herbert Bruce, Toronto, in *Dominion.* The lymphatic glands about the neck are of considerable importance from a surgical standpoint in the saving of other parts from infection. Their function is to collect and drain the lymph and deleterious substances. The lymphatic glands in the submaxillary region are most liable to infection through the mouth. If there be any abrasion in the mouth or as a result of injury produced by an instrument that is affected with bacteria, adenitis will be produced by the

bacteria being carried through the lymph streams. Any pathogenic organism that is present in the mouth, if carried to the glands, is almost always sure to give rise to acute adenitis. Accumulations of tartar around the necks of teeth producing a lacerated condition of the gums may eventually result in the production of adenitis. If those infected areas do not break down in the form of pus they are likely to subside into a chronic swelling, changing the disease from acute into chronic. The glands when in an infected state are very sore to the touch, and can easily be felt under the skin, so that when these glands of the neck are tender to the touch the inference is that they are the seat of inflammatory conditions. Later the patient complains of a throbbing sensation in the affected regions, the skin becomes reddened and adheres to the glands, these symptoms being the precursor of periadenitis. If pus be formed it will eventually burst through the skin. Chronic adenitis may be simple, tuberculous, or syphilitic. These are the three commonest forms of adenitis, and occur more often than the acute form. The simple type often occurs in children and in young adults, and is commonly associated with pediculosis, with chronic discharge from the ear, or with eczema of the face.

SOLILOQUY—FROM SHAKSFEAR.

To have it out or not, that is the question;
Whether it is better for the jaws to suffer
The pangs and torments of an aching tooth,
Or to take steel against a host of troubles,
And, by extracting, end them. To pull, to tug,
No more; and, by a tug, to say we end
The toothache and the thousand natural ills
The jaw is heir to—'tis a consummation
Devoutly to be wished. To pull, to tug;
To tug! perchance to break—aye, there's the rub;
For in that wrench what agonies may come
When we have dislodged the stubborn foe
Must give us pause. There's the respect
That makes an aching tooth of such long life;
For who would bear the whips and stings of pain,
The old wife's nostrum, the dentist's contumely,
The pangs of hope deferred, kind sleep's delay,
The insolence of pity and the spurn
That patient sickness of the healthy takes,
When he himself might his quietus make
For one poor shilling?
Thus dentists do make cowards of us all;
And thus the native hue of resolution
Is sickled o'er with the pale cast of fear;
And many a one whose courage seeks the door
With this regard, his footsteps grow awry,
Scared at the name of dentist.—ERA.